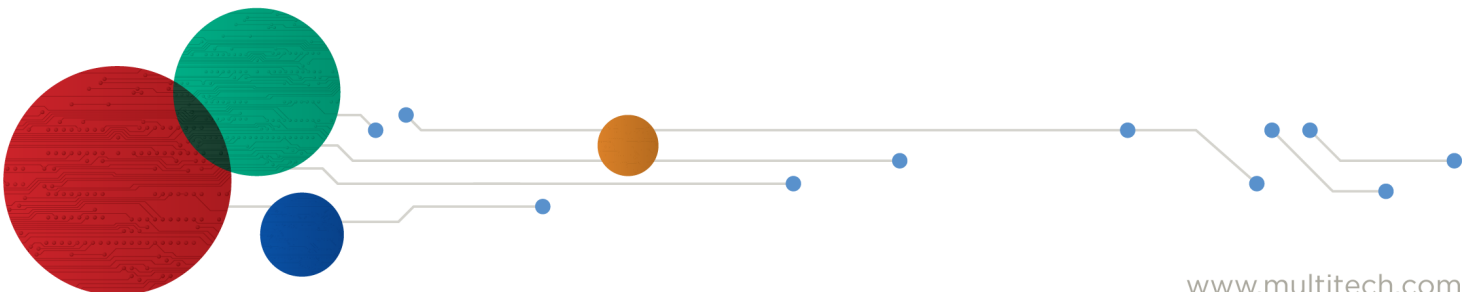


# SocketModem® MTQN

## MTQN-MNG3-B01 Device Guide



## SocketModem® MTQN Device Guide

Models: MTQN-MNG3-B01

Document Part Number: S000712 Rev. 1.8

### 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 © 2025 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

Multi-Tech and the Multi-Tech logo, DeviceHQ, SocketModem, and Conduit are registered trademarks of Multi-Tech Systems, Inc.

mPower, mCard, and mDot are 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.

MULTITECH DOES NOT WARRANT THAT THE TRANSMISSION OF DATA BY A PRODUCT OVER A CELLULAR COMMUNICATIONS NETWORK WILL BE UNINTERRUPTED, TIMELY, SECURE, OR ERROR FREE, NOR DOES MULTITECH WARRANT ANY CONNECTION OR ACCESSIBILITY TO ANY CELLULAR COMMUNICATIONS NETWORK. MULTITECH WILL HAVE NO LIABILITY FOR ANY LOSSES, DAMAGES, OBLIGATIONS, PENALTIES, DEFICIENCIES, LIABILITIES, COSTS, OR EXPENSES (INCLUDING WITHOUT LIMITATION REASONABLE ATTORNEYS FEES) RELATED TO TEMPORARY INABILITY TO ACCESS A CELLULAR COMMUNICATIONS NETWORK USING THE PRODUCTS.

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.

### Disclaimers

Information in this document is subject to change without notice and does not represent a commitment on the part of Multi-Tech Systems, Inc. Multi-Tech Systems, Inc. provides this document "as is," without warranty of any kind, expressed or implied, including, but not limited to, the implied warranties of fitness or merchantability for a particular purpose. Multi-Tech Systems, Inc. may make improvements and/or changes in this manual or in the product(s) and/or the software described in this manual at any time.

# Contents

<b>Chapter 1 Product Overview</b>	<b>6</b>
Overview	6
Product Build Options	6
Documentation	6
<b>Chapter 2 Mechanical Drawings</b>	<b>8</b>
MTQN-MNG3-B01	8
<b>Chapter 3 Hardware and Specifications</b>	<b>9</b>
Specifications	9
Mounting Hardware	10
Recommended Parts	10
40-Pin Connector Definitions	10
MTQN-MNG3-B01 Pin Definitions	11
40-Pin Connector	11
Electrical Characteristics	12
Operating Conditions	12
Absolute Maximum Ratings	12
Nominal Ratings	13
Power Draw	14
<b>Chapter 4 Antennas</b>	<b>15</b>
Antenna	15
Antenna Specifications	15
<b>Chapter 5 Safety Instructions</b>	<b>16</b>
Handling Precautions	16
Radio Frequency (RF) Safety	16
Sécurité relative aux appareils à radiofréquence (RF)	16
General Safety	17
Interference with Pacemakers and Other Medical Devices	17
Precautions for Pacemaker Wearers	17
Vehicle Safety	18
Operation Safety	18
<b>Chapter 6 Getting Started</b>	<b>19</b>
Developing with an MTQN in Mbed	19
About Mbed	19
Programming the MTQN Microcontroller	19

Useful Links.....	19
ST Microcontroller STM32L471QG .....	20
Communications Flow.....	20
MTQN-MNG3-B01.....	20
Installing a SIM Card in a SocketModem MTQN.....	20
USB Driver Installation.....	21
USB Cable Recommendations .....	21
Device Reset .....	21
MTQN-MNG3-B01.....	21
Low Power Modes .....	22
Powering Down the Cellular Radio .....	23
Configuring u-blox Cellular Radio .....	23
USB Driver Installation .....	25
<b>Chapter 7 Labels .....</b>	<b>26</b>
Approvals and Certifications.....	26
Example Labels.....	26
<b>Chapter 8 Regulatory Information .....</b>	<b>27</b>
EU EMC, Safety, and Radio Equipment Directive (RED) Compliance .....	27
<b>Chapter 9 Environmental Notices .....</b>	<b>28</b>
EU WEEE Directive.....	28
Instructions for Disposal of WEEE by Users in the European Union.....	28
EU REACH-SVHC Statement.....	28
EU RoHS 3 Directive.....	29
<b>Chapter 10 Using Connection Manager .....</b>	<b>30</b>
Installing Connection Manager .....	30
Setting Up a Serial Device in Windows Device Manager .....	31
Connecting a Device .....	33
Uninstalling Connection Manager .....	34
Connection Manager User Interface.....	35
Main tab.....	36
Settings tab .....	36
Connection tab.....	37
Details tab.....	37
Terminal tab .....	37
Charts tab.....	37
Troubleshooting.....	37
Serial COM port is not available in the Serial Modem Settings.....	37
Device is not detected ("No Device").....	37
USB Modem is not detected .....	38

Connection Manager is not working, and a device connected to the computer is not detected.....	38
Connection Manager displays "Device Error" status for a serial device.....	38
System Cannot Connect to Serial Device .....	38
<b>Warranty .....</b>	<b>42</b>
<b>Contact Information .....</b>	<b>42</b>
<b>Revision History.....</b>	<b>42</b>

# Chapter 1 Product Overview

## Overview

The SocketModem® MTQN cellular System-on-Module (SoM) is a small version of the SocketModem MTQ System-on-Module (SoM). Both embedded devices offer developers the functionality of an on-board cellular radio all-in-one compact design. The SocketModem MTQN provides a practical solution to the market's demand for a smaller, low-power module.

The SocketModem MTQN functions similarly to the SocketModem MTQ and maintains interoperability with legacy systems that use a 40-pin connector and forward mounting hole. All SocketModem software is open source.

## Product Build Options

The available SocketModem MTQN modules are:

Model	Description	Region
MTQN-MNG3-B01	Embedded LTE Cat M1 and 2G Cellular SoM	EU/UK
<b>Developer Kit</b>		
MTUDK2-ST-CELL	SocketModem MTQ & SocketModem MTQN Developer Kit	Global

**Note:** These units ship without network activation. To connect them to the cellular network, you need SIM cards from your service provider. The complete product code may end in .Rx. For example, MTQN-MNG3-B01.Rx, where R is revision and x is the revision number. All builds can be ordered individually or in 50-packs.

## Documentation

The following documentation is available on the product page at <https://multitech.com/all-products/cellular/embedded-modems/multitech-socketmodem-mtqn>.

Document	Description	Part Number
MTQN-MNG3-B01 Device Guide	Provides model specifications and developer information regarding the B01 version of MTQN.	S000712
Universal Developer Kit 2.0 Developer Guide.	Provides information for using the developer board with the MTQN.	S000610
ST Microcontroller Data Sheet	Data sheet for processor STM32L471QG: <a href="https://www.st.com/en/microcontrollers/stm32l471qg.html">https://www.st.com/en/microcontrollers/stm32l471qg.html</a>	027226 Rev 1
Sara-R4 USB Driver Installation Guide	Provides instructions on how to install Windows USB driver.	N/A

Document	Description	Part Number
Sara-R4/N4 series, AT Commands Manual (Check radio and manual)	Provides AT commands and parameters used to configure your device.	UBX-17003787

**Note:** Additional documentation is available at [www.multitech.net](http://www.multitech.net). See *Chapter 6, Getting Started* for details.

# MTQN-MNG3-B01





# Chapter 3 Hardware and Specifications

## Specifications

Category	Description
Performance <sup>1</sup>	3GPP Release 13 LTE Cat M1, 3GPP Release 13 LTE Cat NB1, Coverage Enhancement Mode A, Release 12 LTE Power Save Mode, PSM, Rel 13 e-DRX, Cat M1 Half Duplex (Up to 375 kbps downlink and uplink), Cat NB1 Half Duplex (Up to 27.2K kbps downlink and 62.5K kbps uplink), Cat NB1 Non-IP Data Delivery, and 2G GPRS/EGPRS
Frequency Band (MHz)	Europe  LTE FDD (Cat M1/NB1) 700 MHz (B12), 750 MHz (B13), 800 MHz (B20), 850 MHz (B5), 900 MHz (B8), AWS1700 MHz (B4), 1800 MHz (B3), and 1900 MHz (B2).  2G GSM 850 MHz , E-GSM 900 MHz, DCS 1800 MHz, and PCS 1900 MHz
<b>Interface</b>	
Connectors	1 UFL (Cellular), 1x Micro USB, 1x 40-Pin Board-to-Board
Host Processor	Cortex-M4 (STM32L471QG) 1 Mbyte Flash and 128 Kbyte SRAM (B01)
I/O	1 x UART, 1 x HS USB, 2 x SPI, 2 x I2C, up to 9 analog inputs and up to 29 digital input/output
SMS	Mobile Terminate/Mobile Originate PDU / Text mode
LED	Link Status, solid = registered, for default setting use AT+UGPIOC 16, 2 (see AT command guide for details and more options)
<b>Physical Description</b>	
Weight	less than 0.3 oz (8.5g)
Dimensions	28.96mm x 32.51mm (1.14 x 1.28 inches). Refer to Mechanical Drawings for details.
<b>Connectors</b>	
Antenna	1 surface mount U.FL: cellular
SIM Holder	1.8 V and 3 V Micro SIM (3FF) card. SIM denotes: Subscriber Identity Module.
Pin header	40-pin female for USB or UART
<b>Environment</b>	
Operating Temperature <sup>2</sup>	-40° C to +85° C (-40° F to +185° F)
Storage Temperature	-40° C to +85° C (-40° F to +185° F)

Category	Description
Humidity <sup>3</sup>	15%-93% RH, non-condensing
<b>Power Requirements</b>	
Input Voltage (using micro-USB connector)	5.0 VDC
Input Voltage (using 40-pin connector)	3.3 VDC or 5.0 VDC
<b>Certifications and Compliance</b>	
EMC Compliance	CE Mark, RED (EU)
Radio Compliance	CE Mark, RED (EU)
Safety Compliance	IEC 60950-1 2nd ED +Am.2
Network	GCF
Carrier	EU Carriers

<sup>1</sup>Actual performance speeds may be affected by a variety of attributes such as cell tower distance, data loads, packet sizes, etc.

<sup>2</sup>Device has been tested up to +85° C. UL Recognized @ 85° C.

<sup>3</sup>Radio performance may be affected by temperature extremes. This is normal.

## Mounting Hardware

The board has two mounting holes at the corners. Use #4 or M3 hardware for mounting the SocketModem MTQN to the board. Refer to the Mechanical Drawings for more information.

Here are some standoffs that can be used with this product.

## Recommended Parts

Manufacturer	Part	Part Number
PEM (Penn Engineering & Manufacturing)	Surface Mount Standoff	SMTSO-M3-6
RAF Electronic Hardware	6mm Hex Female Standoff	1251-3005-S-12-Zinc

**Note 1:** We recommend grounding the standoffs to the main PCB for better performance.

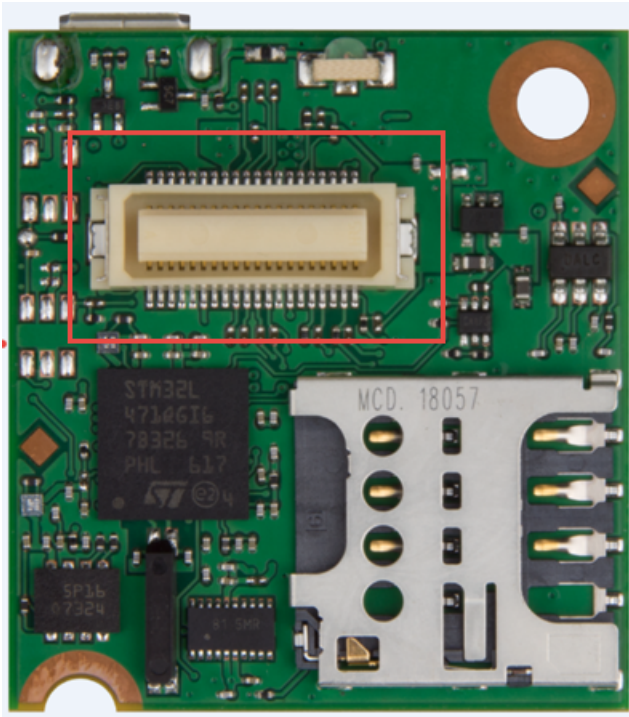
**Note 2:** For other stacking heights, refer to the Hirose DF17 Series 0.5mm Pitch Board to Board Connector Data Sheet to select the appropriate spacers.

## 40-Pin Connector Definitions

The SocketModem MTQN offers developers an FCC and carrier certified solution that makes connecting sensors and other edge-of-network devices quick and easy.

40-Pin Connector

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21



## MTQN-MNG3-B01 Pin Definitions

### Note:

To program and use the SocketModem MTQN, you will need a UDK2 Developer Kit.

For more pinout information and other details, refer to the STM32L471QG processor manual. In addition to their stated functions, all GPIO pins (PA\_\*, PB\_\*, PC\_\*, PG\_\*) can also be used as Digital-In and Digital-Out interfaces.

### Hardware and Software Pinout Information

Refer to both the hardware and software pinout information on the Multitech Developer Resources site at: [http://www.multitech.net/developer/wp-content/uploads/2019/02/MTQN\\_Pin\\_Info\\_02-19.xlsx](http://www.multitech.net/developer/wp-content/uploads/2019/02/MTQN_Pin_Info_02-19.xlsx)

## 40-Pin Connector

Manufacturer	Hirose Electric Co LTD
Description	.5MM 40 PN B>B RECEPTACLE
Model Number	DF17(4.0)-40DP-0.5V(57)

Use with:

<b>Manufacturer</b>	Hirose Electric Co LTD
<b>Description</b>	.5mm 40 pin B.B header PLUG
<b>Model Number</b>	DF17(2.0)-40DP-0.5V(57)

## Electrical Characteristics

### Operating Conditions

Parameter	Minimum Volts	Maximum Volts
Supply Range - Vcc	3.3 VDC +/- 5%	5.0 VDC +/- 5%

### Absolute Maximum Ratings

Symbol	Description	Conditions	Min.	Max.	Unit
SIM	SIM interface	Input DC voltage at SIM digital interfaces pins	-0.3	3.9	V
P_ANT	Antenna power	Input RF power at ANT pin		-22	dbM
Rho_ANT	Antenna ruggedness	Output RF load mismatch ruggedness at ANT pins		10.1	VSWR
tstg	Storage Temperature		-40	85	°C
V <sub>P</sub>	Voltage at any pin	Voltage at any signal pin	-0.3	4	V
V <sub>DDX</sub> - V <sub>SS</sub>	External voltage	V <sub>DDX</sub> , V <sub>DDA</sub> , V <sub>DDIO2</sub> , V <sub>BAT</sub> <sup>1</sup>	-0.3	4	V
V <sub>IN</sub> <sup>2</sup>	Input Voltage	Input voltage on FT_XXX pins	V <sub>SS</sub> -0.3	min (V <sub>DD</sub> , V <sub>DDA</sub> , V <sub>DDIO2</sub> ) + 4.0 <sup>3 &amp; 4</sup>	V
		Input voltage on TT_XX pins	V <sub>SS</sub> -0.3	4.0	V
		Input voltage on BOOT0 pin	V <sub>SS</sub>	9.0	V
		Input voltage on any other pins	V <sub>SS</sub> -0.3	4.0	V
ΔV <sub>DDX</sub>	Variations between power pins	Variations between different V <sub>DDX</sub> power pins of the same domain	N/A	50	mV
V <sub>SSX</sub> -V <sub>SS</sub>	Variations between ground pins	Variations between all the different ground pins <sup>5</sup>	N/A	50	mV

Data taken from STM32L471QG processor datasheet.

(1) All main power (V<sub>DD</sub>, V<sub>DDA</sub>, V<sub>DDIO2</sub>, V<sub>BAT</sub>) and ground (V<sub>SS</sub>, V<sub>SSA</sub>) pins must always be connected to the external power

- (2)  $V_{IN}$  maximum must always be respected. Refer to Nominal Ratings for the maximum allowed injected current values.
- (3) This formula has to be applied only on the power supplies related to the IO structure described in the pin definition table.
- (4) To sustain a voltage higher than 4 V the internal pull-up/pull-down resistors must be disabled.
- (5) Include VREF- pin.

## Nominal Ratings

Symbol	Ratings	Max Voltage (mA)
$\Sigma I_{DD}$	Total current into sum of all VDD power lines (source) <sup>1</sup>	150
$\Sigma I_{SS}$	Total current out of sum of all VSS ground lines (sink) <sup>1</sup>	150
$I_{DD(PIN)}$	Maximum current into each VDD power pin (source) <sup>1</sup>	100
$I_{SS(PIN)}$	Maximum current out of each VSS ground pin (sink) <sup>1</sup>	100
$I_{IO(PIN)}$	Output current sunk by any I/O and control pin except FT_f	20
	Output current sunk by any FT_f pin	20
	Output current sourced by any I/O and control pin	20
$\Sigma I_{IO(PIN)}$	Total output current sunk by sum of all I/Os and control pins <sub>2</sub>	100
	Total output current sourced by sum of all I/Os and control pins <sub>2</sub>	100
$I_{INJ(PIN)}^3$	Injected current on FT_xxx, TT_xx, RST and B pins, except PA4, PA5	-5/+0 <sup>4</sup>
	Injected current on PA4, PA5	
$\Sigma  I_{INJ(PIN)} $	Total injected current (sum of all I/Os and control pins) <sup>5</sup>	-5/0
		25

Data taken from STM32L471QG processor datasheet.

- (1) All main power ( $V_{DD}$ ,  $V_{DDA}$ ,  $V_{DDIO2}$ ,  $V_{BAT}$ ) and ground ( $V_{SS}$ ,  $V_{SSA}$ ) pins must always be connected to the external power, in permitted range.
- (2) This current consumption must be correctly distributed over all I/Os and control pins. The total output current must not be sunk/sourced between two consecutive power supply pins referring to high pin count QFP packages.
- (3) Positive injection (when  $V_{IN} > V_{DDIOx}$ ) is not possible on these I/Os and does not occur for input voltages lower than the specified maximum value.
- (4) A negative injection is induced by  $V_{IN} < V_{SS}$ .  $I_{INJ(PIN)}$  must never be exceeded. Refer to the Absolute Maximum Ratings table for the minimum allowed input voltage values.

(5) When several inputs are submitted to a current injection, the maximum  $\sum |I_{INJ(PIN)}|$  is the absolute sum of the negative injected currents (instantaneous values).

## Power Draw

Voltage	Radio Protocol	Low Power/Sleep Mode (uA)	Live Connection Idle-No Data(μA)	(AVG) Measured Current at Max Power(mA) <sup>1</sup>	TX Pulse <sup>2</sup> (AVG) Amplitude Current for Peak Current(mA)	Total Inrush Charge <sup>3</sup> in MilliCoulombs (mC)
5.0 VDC with Unit in Dev Card	GSM850	8.5	25	201	1,130	0.245
5.0 VDC USB Only, No Dev Card	GSM850	292	42	284	1,147	0.281
3.3 VDC with Unit in Dev Card, External DC Supply Used	GSM850	7.5	28	N/A	N/A	N/A
5.0 VDC with Unit in Dev Card	LTE	8.5	42	180	680	0.245
5.0 VDC USB Only, No Dev Card	LTE	292	58	238	864	0.281
3.3 VDC with Unit in Dev Card, External DC Supply Used	LTE	7.5	55	N/A	N/A	N/A

<sup>1</sup>**Maximum Power:** The continuous current during maximum data rate with the radio transmitter at maximum power.

<sup>2</sup>**Tx Pulse:** The average peak current during a GSM 850 transmission burst period or LTE connection. The transmission burst duration for GSM 850 can vary, depending on what transmission scheme is being deployed (GPRS Class 8, Class 10, GSM, etc.).

<sup>3</sup>**Inrush Charge:** The total inrush charge at power on.

## Chapter 4 Antennas

### Antenna

Devices were approved with the following antenna:

Manufacturer: Wieson  
Description: LTE Antenna with SMA-Male Connector  
Model Number: GY115IE002-001

#### MultiTech ordering information:

Model	Quantity
ANLTE4-1HRA	1
ANLTE4-2HRA	2
ANLTE4-10HRA	10
ANLTE4-50HRA	50

### Antenna Specifications

Category	Description
Frequency Range	0.698 - 0.96 GHz 1.710 - 2.170 GHz 2.30 - 2.69 GHz
VSWR	3:1 maximum
Gain	2.06 dBi
Impedance	50Ω nominal
Radiation	Omni-directional
Polarization	Linear, vertical

## Chapter 5 Safety Instructions

---

### 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.

## General Safety

The device is designed for and intended to be used in fixed and mobile applications. Fixed means the device is physically secured at one location and cannot be easily moved to another location. Mobile means the device is used in other than fixed locations.

**CAUTION:** Maintain a separation distance of at least 20 cm (8 inches) between the transmitter's antenna and the body of the user or nearby persons. The device is not designed for or intended to be used in portable applications within 20 cm (8 inches) of the user's body.

**Attention:** Maintenir une distance d'au moins 20 cm (8 po) entre l'antenne du récepteur et le corps de l'utilisateur ou à proximité de personnes. Le modem n'est pas conçu pour, ou destinés à être utilisés dans les applications portables, moins de 20 cm du corps de l'utilisateur.

## 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 6 Getting Started

### Developing with an MTQN in Mbed

The MTQN ships with AT pass-through firmware, which directly connects the cellular radio to a serial port made available via micro USB connector J6 on the MTUDK2-ST-CELL developer board. The firmware:

- Runs at 115200 baud by default to match with the cellular radio's default baud rate.
- Prints debug messages from the debug port at 115200 baud.
- Allows users to increase or decrease the application's baud rate by entering a plus (+) or minus (-) character on the USB debug port. Issuing a plus or minus character on the USB debug port changes the external serial port speed as well as the speed of the link between the processor and the radio. The speed of the USB debug port on reset is always 115200 to match the radio's default regardless of the baud rate used at the time of reset.
- Uses RTS/CTS flow control on the serial connection to the radio and on the external serial connection. Enables RTS/CTS flow control on terminal emulators used with the AT pass-through firmware.

### About Mbed

ARM Mbed is a free, open-source platform and operating system for embedded devices using the ARM Cortex-M microcontrollers. The platform includes a standards-based C/C++ SDK, a microcontroller HDK, and supported development boards, an online compiler and online developer collaboration tools.

### Programming the MTQN Microcontroller

With the MTQN and the MTUDK2-ST-CELL developer board, use the ARM Mbed ecosystem to program the microcontroller. Compile in the cloud or locally, copy the resulting binary file to the Mbed USB drive, and reset the MTQN-MNG3.

MTQN software is open source.

### Useful Links

Description	Link
MTUDK2-ST-CELL developer guides (see Manuals for different versions)	<a href="https://www.multitech.com/models/94557065LF">https://www.multitech.com/models/94557065LF</a>
Serial Flash Datasheet (pdf):	<a href="http://www.micron.com">http://www.micron.com</a> (refer to P/N M25P16)
Additional Information:	<a href="https://multitech.com/all-products/cellular/embedded-modems/multitech-socketmodem-mtqn">https://multitech.com/all-products/cellular/embedded-modems/multitech-socketmodem-mtqn</a>

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).

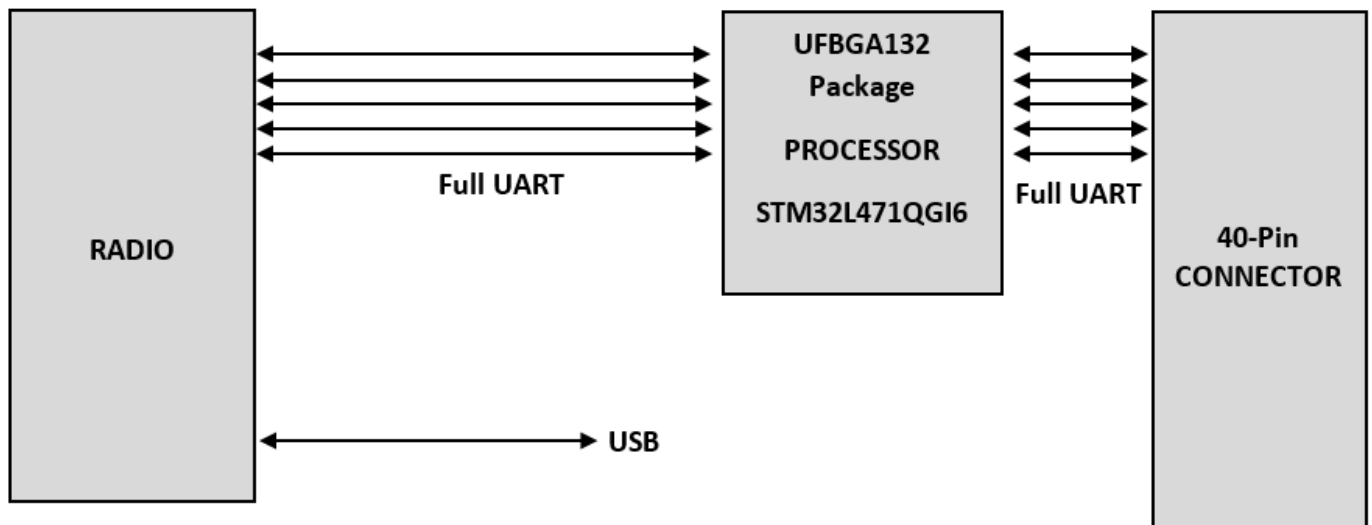
## ST Microcontroller STM32L471QG

For the ST microcontroller STM32L471QG reference manual and datasheet, refer to the product page at <https://www.st.com/en/microcontrollers/stm32l471qg.html>.

## Communications Flow

### MTQN-MNG3-B01

The MTQN-MNG3-B01 provides full UART from the cellular radio to the processor as well as the user application. Model B01 provides a direct USB interface connection to the radio, but not through the 40-pin connector.



Switching between the USB interface and serial port requires a reset. The cellular radio checks for a USB connection upon reset. If USB is not present, it only uses the serial port. If USB is present upon reset, it only uses USB.

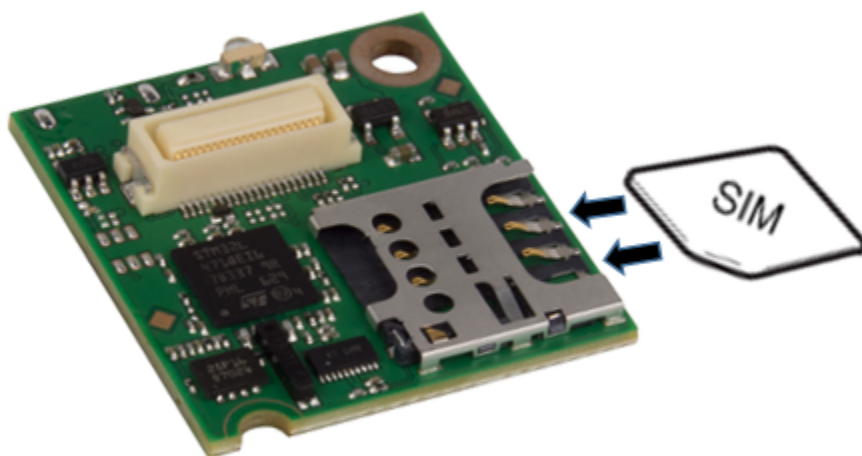
## Installing a SIM Card in a SocketModem MTQN

**Note:** All SocketModem MTQN models require the use of a Micro SIM (3FF) card.

To install the SIM card:

- Refer to the image below.

- Slide the SIM card completely into the SIM holder.



## USB Driver Installation

For the Windows USB driver, refer to the SARA-R4 USB Driver Installation Guide on the product page of the MultiTech website. The driver is located under the Downloads section of the product page.

For the Linux USB driver, if your Linux OS does not automatically detect your device, you may need to execute a script. This script adds the MTQN vendor ID and product ID to the USB serial driver. Download the zip file which contains this script and readme file under Downloads on the product page of the website.

## USB Cable Recommendations

If your device has a USB connector, to avoid enumeration or power issues:

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

## Device Reset

### MTQN-MNG3-B01

There are two components to reset.

1. Processor reset: Several reset methods are available and all are documented in the STM32L471QG reference guide.
2. Radio reset: The processor controls the RESET\_N and PWR\_ON pins to the radio. The functionality of those pins is described in the ublox SARA\_R4 data sheet.

**Note:**

N\_RESET of the 40 pin connector is directly connected to NRST of the STM32L471QG processor. The processor controls the PWR\_ON(RADIO\_ONOFF/PE\_4) and RESET\_N(RADIO\_RESET/PF\_3) pins to the radio.

## Low Power Modes

**NOTE for MNG3:** eDRX and PSM modes are not supported in 2G (all modes are supported using Cat M1).

To achieve lowest power consumption, we recommend powering down the radio then configuring RADIO\_PWR, VMEM\_EN and BUF\_EN as analog inputs with no pull resistor. The last step is to place the processor in a low power mode of your choosing.

**WARNING:** If your application is using the on board flash memory part, make sure any flash accesses are complete before removing power or the memory may be corrupted.

### Cellular Radio Low Power

**Note:** Refer to the U-blox AT command guide for details on AT commands.

1. Powering Down - See Powering Down The Cellular Radio section
2. PSM mode- AT+CPSMS command
3. eDRX- AT+CEDRXS command
4. Device functionality- AT+CEDRXS command

### Power to Cellular Radio

After power down, RADIO\_PWR can be configured as an analog input with no pull resistor to disable the power supply regulator that powers the radio. There is an on board resistor that sets the RADIO\_PWR signal level so that the regulator is disabled.

### On Board Flash Memory

After power down, RADIO\_PWR can be configured as an analog input with no pull resistor to disable the power supply regulator that powers the radio. There is an on board resistor that sets the RADIO\_PWR signal level so that the regulator is disabled.

### Level translator

BUF\_EN can be configured as an analog input with no pull resistor to disable the level shifter. There is an on board resistor that sets the BUF\_EN signal level so power is removed.

### STM32L471QG processor

See the STM32L471QG data sheet for low power modes.

## Powering Down the Cellular Radio

**CAUTION:** Failing to properly power down the cellular radio before removing power may corrupt the radio's file system.

To properly power down the cellular radio, use one of the following methods:

1. Issue command AT+CPWROFF then either wait 40s or until 1.8v from the cellular radio goes low. Processor pin PC5 (Mbed pin name MON\_1V8) has 1.8v from the radio connected to it.
2. Hold pin processor PE\_4 (Mbed pin name RADIO\_ONOFF or MDMPWRON) low for at least 1.5s. 1.8v from the radio should go low.
3. If neither of the above two options are successful, an emergency power down can be performed by holding processor pin PF\_3 (Mbed pin name RADIO\_RESET) low for 10s. As always, power down is confirmed by monitoring 1.8v from the radio.

## Configuring u-blox Cellular Radio

This MNG3 device uses a cellular radio that can operate on different carrier networks (not simultaneously).

You must configure your module based on your carrier network and application. This includes setting the applicable MNO profile (based on carrier), RAT (type of technology you wish to use such as Cat M1), and LTE bands intended for the application device within regulatory compliance. The module is not intended be used in the factory-default setting.

Depending on your MNO profile, certain elements may or may not be available. Refer to the table for details.

### Updates to MNO profile version:

MNO	Version	System Selection	LTE Bands	PSM <sup>1</sup>	eDRX <sup>2</sup>	URAT <sup>3</sup>	UBANDMASK <sup>4</sup>
AT&T	v 7.2	M1->2G	2, 4, 5, 12	yes	no	yes	yes
Deutsche Telekom	v 7.1	M1->NB1->2G	3, 8, 20	yes	yes	yes	yes
Standard Europe	v 7.1	M1->NB1->2G	3, 8, 20	yes	yes	yes	yes
T-Mobile USA	v 7.1	NB1->2G	2, 4, 5, 12	no	no	yes	yes
Vodafone	v 7.1	NB1->2G->M1	3, 8, 20	yes	no	yes	yes
SW default	N/A	M1->NB1->2G	2, 3, 4, 5, 8, 12, 20	no	no	no	no

- Note 1: +CPSMS
- Note 2: +CEDRXS
- Note 3: +URAT
- Note 4: +UBANDMASK

If your carrier network is not on the supported list of MNOs, you must set to Cat M1 mode and follow the instructions per that scenario below.

The MNG3 model has regulatory approval to operate in the EU/UK. We continue to work for approval on other networks. Refer to the Sara-R4/N4 series AT Commands Manual for the list of supported MNOs and other details.

**Note:** If your device is on +UMNOPROF: 0 (SW default), you do not have a network defined yet and must set one.

**To set or switch carrier networks:**

1. Deregister the module from the network or perform an AT+CFUN=0 cycle:

```
AT+CFUN=0
```

2. Set the carrier network (refer to the list of +UMNOPROF values):

To Vodafone:

```
AT+UMNOPROF=19
```

To Standard Europe:

```
AT+UMNOPROF=100
```

3. Reboot the module in order to apply the new configuration:

```
AT+CFUN=15
```

**If the APN is known and will not change:** We recommend hard-coding the MNO and setting the PDP context manually. The following example of an AT command sequence is for Vodafone.

```
AT+CFUN=0
```

```
AT+UMNOPROF=19
```

```
AT+CGDCONT=1, "IPV4V6", "phone"
```

```
AT+CFUN=15
```

**If the MNO is not listed:** the following command sequence is recommended.

**NOTE:** We recommend changing +UMNOPROF separately before +UBANDMASK.

```
AT+CFUN=0
```

```
AT+UMNOPROF=0
```

```
AT+CFUN=15
```

```
AT+CFUN=0
```

```
AT+CGDCONT=..
```

```
AT+UBANDMASK=..
```

```
AT+CFUN=15
```

**To configure the supported radio bands:** Use the +UBANDMASK command if your MNO is not listed by the +UMNOPROF command. Refer to your specific carrier regarding available bands.



## USB Driver Installation

For the Windows USB driver, refer to the SARA-R4 USB Driver Installation Guide on the product page of the Multitech website. The driver is located under the Downloads section of the product page.

For the Linux USB driver, if your Linux OS does not automatically detect your device, you may need to execute a script. This script adds the MTQN vendor ID and product ID to the USB serial driver. Download the zip file which contains this script and readme file under Downloads on the product page of the website.

# Chapter 7 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.
- **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 EU rules (RED compliance). 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 the actual size.

- 1 - MultiTech Model Identification
- 2 - MultiTech Ordering Part Number
- 3 - IMEI

Device Label



Package Label



## Chapter 8 Regulatory Information

---

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



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

- Council Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment; and
- Council Directive 2014/53/EU on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

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

## Chapter 9 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 10 Using Connection Manager

---

Use Connection Manager to:

- Install the latest device drivers.
- Connect your device to your carrier's network.  
**Note:** Connection Manager can install drivers and connect your device regardless of your cellular network; however, activation is only supported with Verizon, Aeris, and some regional carriers.
- Switch the firmware in your device to a different carrier (if supported by your device).
- Manage cellular connection and automatically reconnect with the keep-alive feature.
- View device details.
- View line charts of signal level and data rates.
- Use a terminal window for communicating with and troubleshooting the device.

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

### Installing Connection Manager

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

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

To install Connection Manager and the device drivers:

1. Go to <https://multitech.com/all-products/software-management/connection-manager/>.
2. Click **Connection Manager**.
3. Open or unzip the **Connection Manager** file and run the installer (.msi file).
4. On the MultiTech Connection Manager Setup Wizard Welcome Panel, click **Next**.
5. Read the end-user license agreement and check **I accept the terms in the License Agreement**. Click **Next**.
6. Click **Next** to have the installer automatically disable the native WWAN AutoConfig service in Windows.  
  
The WWAN AutoConfig service manages mobile broadband connections. Connection Manager requires that this service be disabled.  
  
**Note:** This page appears in Windows 10 and Windows 11.
7. If any Multichannel device is connected to the computer, disconnect it and click **Next**.
8. If you use a USB device, check **Install the modem driver**.

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

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

9. To specify a folder for Connection Manager, use the default folder or click **Change** to browse to the folder you want to use. Click **Next**.
10. Click **Install**. Windows may prompt you to allow the installer to make changes to your computer. Click **Yes**.
11. In the Setup Wizard, click **Finish**.

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

If using a USB device, you can connect the device to the carrier's network with Connection Manager. 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](#).

**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.

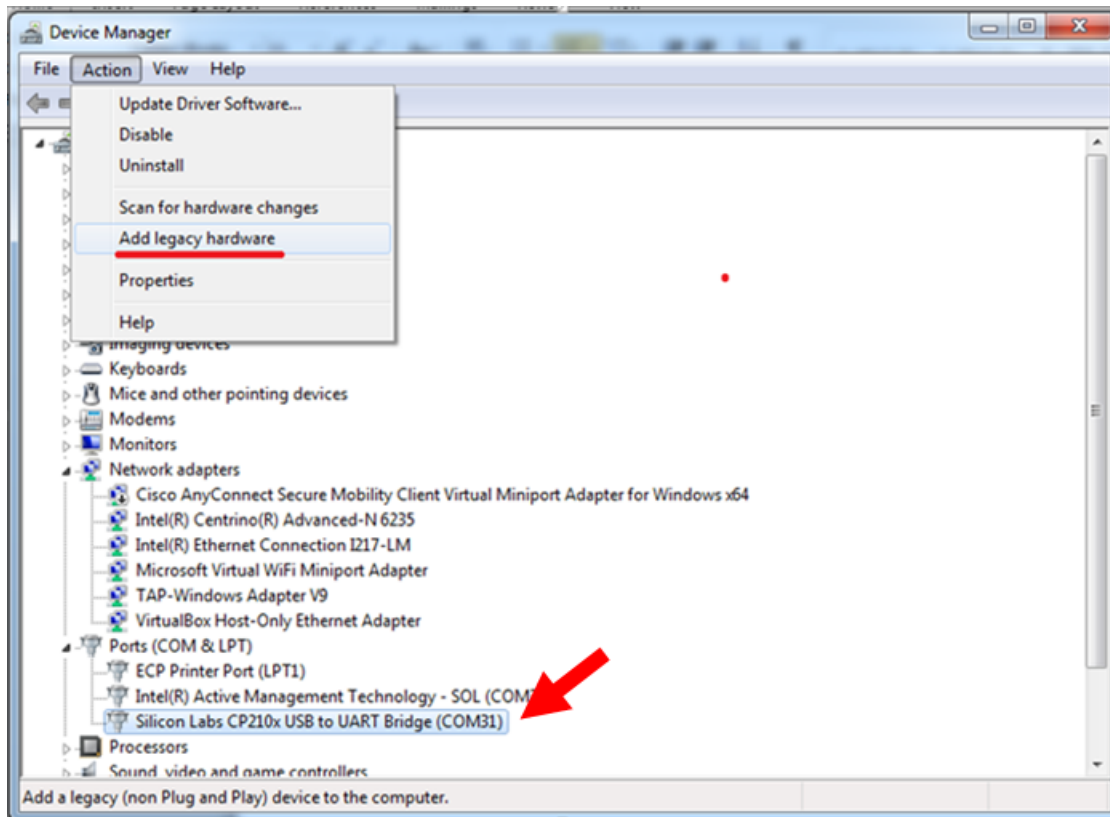
## Setting Up a Serial Device in Windows Device Manager

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, 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](#).

**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](http://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.

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**.

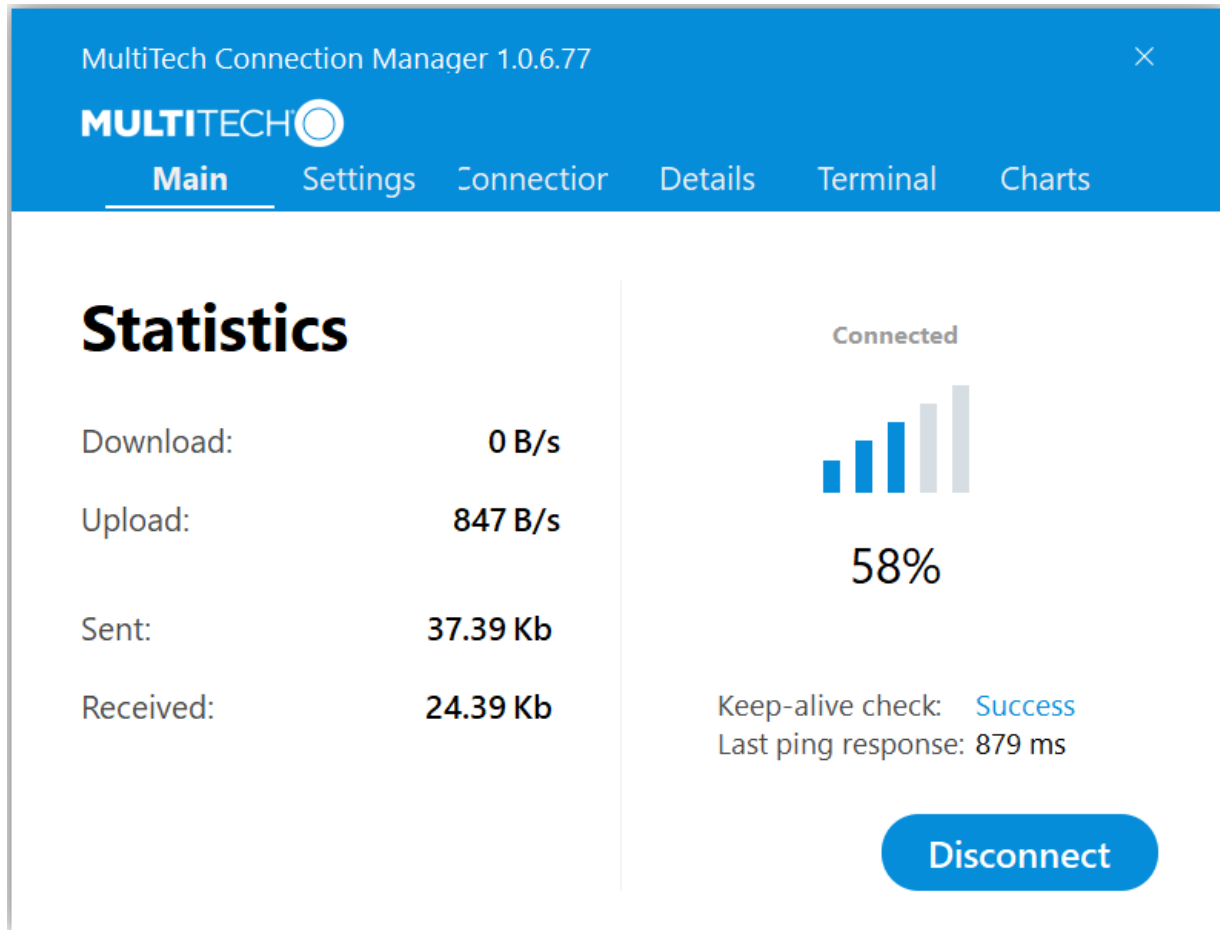
Connection Manager and the installed drivers are removed from the computer.

**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 <b>Settings</b> tab.	On the <b>Settings</b> tab, select the COM port that matches the port that the device is installed on and click <b>Apply</b> . You can look up the port in Device Manager in Windows. In Device Manager, expand <b>Modems</b> , right-click the name of your device, and select <b>Properties</b> . Note the port on the <b>Modem</b> 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.

MultiTech Connection Manager 2.2.0.4

**MULTITECH**

Main Settings Connection Details Terminal Charts

☐ USB Modem ☒ Serial Modem

Port: COM10

Parity: None

Bits per second: 115200

Stop bits: 1

Data bits: 8

Flow control: None

☐ Run application at Windows startup

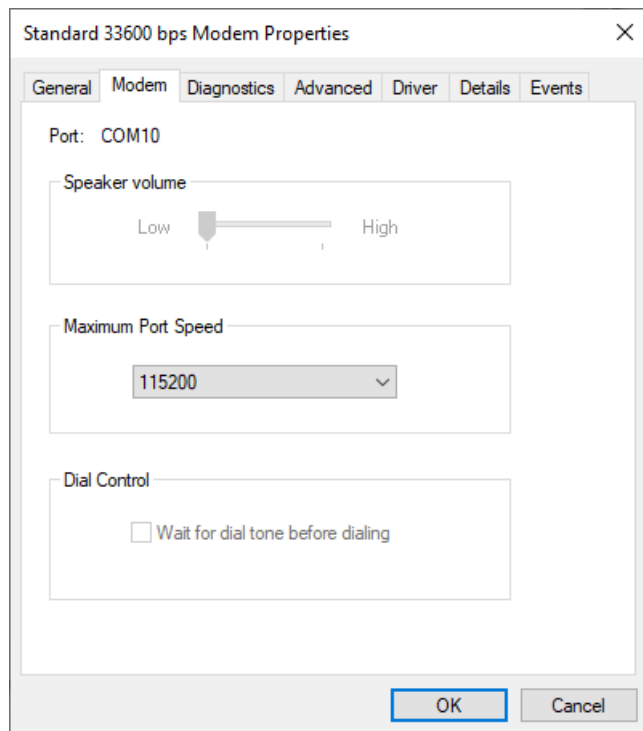
☐ Connect to the Internet automatically

Apply

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

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

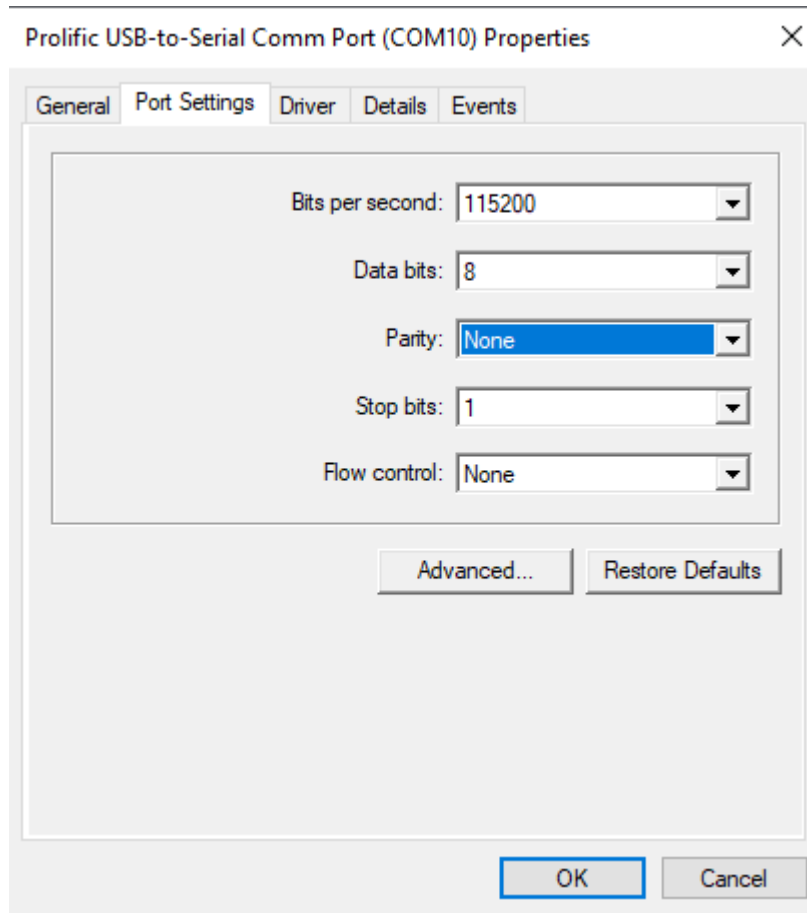
Click the **Modem** tab to confirm the **Maximum Port Speed** matches Bits per second setting in Connection Manager.



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**, **Data bits**, **Parity**, **Stop bits** and **Flow control** match those settings in Connection Manager.





---

## Warranty

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

## Contact Information

General Information	<a href="mailto:info@multitech.com">info@multitech.com</a> <a href="https://multitech.com/contact-us/">https://multitech.com/contact-us/</a>
Sales	+1 (763) 785-3500 <a href="mailto:sales@multitech.com">sales@multitech.com</a>
Technical Support Portal	+1 (763) 717-5863 <a href="https://support.multitech.com">https://support.multitech.com</a>
Website	<a href="http://www.multitech.com">www.multitech.com</a>
World Headquarters	2205 Woodale Drive Mounds View, MN 55112 USA

## Revision History

Revision Number	Description	Revision Date
1.8	Updated marketing branding.	January 2025
1.7	Clarified input voltages.	November 2024
1.6	Updated Mounting Hardware section.	December 2021
1.5	Added Connection Manager.	October 2019
1.4	Added Mounting Hardware.	August 2019
1.3	Added MNO profiles.	June 2019
1.2	Minor updates.	June 2019
1.1	Minor updates.	January 2019
1.0	Original publication.	September 2018