

Quick Start **Guide**

NTC-100

4G LTE Cat M1/NB1 Industrial IoT Serial Modem



Quick start guide

This quick start guide will help you set up and connect your device quickly and easily. More advanced set up instructions can be found in the user guide which can be downloaded from <https://support.netcommwireless.com/products/NTC-100>.

Package contents

The NTC-100 package includes:



1 x NTC-100



1 x Quick Start Guide



1 x Y-cable
(Nano-fit to DE-9 and DC power input)



1 x DIN rail mounting bracket



1 x Torx screw

Prerequisites

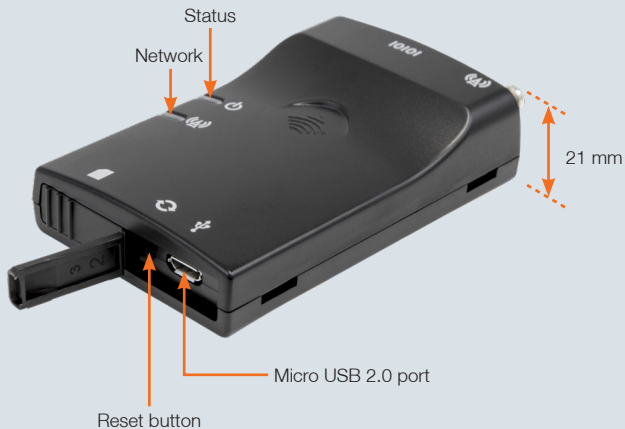
Depending on your circumstances, you may require some of the following items to complete the installation of the NTC-100 serial modem:

- An AC/DC power adapter,
 - 2.1mm centre positive jack,
 - 100-240V AC : 12V DC/1.5A (used in conjunction with the included Y-cable)
- A suitable cellular antenna such as the NANT-00001-000 (LTE Tube Antenna)
- A standard USB to USB Micro Type B cable
- Additional screws and fasteners
- A Windows PC or other device with an available serial or USB port
- A terminal emulation client such as PuTTY
- A T6 Torx driver to secure the SIM slot (optional)

Device Overview



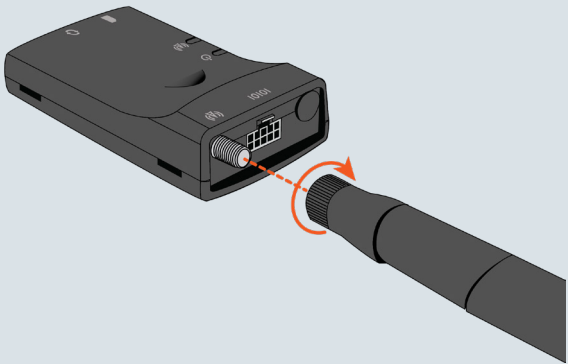
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Installation

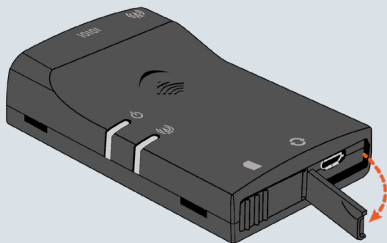
Connecting the antenna

Connect the antenna to the SMA connector on the NTC-100 serial modem by placing it on the SMA connector and turning it in a clockwise direction.

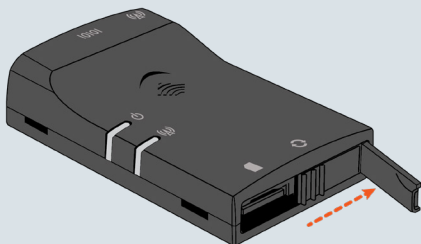


Inserting the SIM card

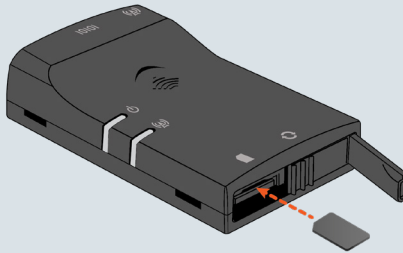
1. Lift the cover from the right side. This reveals the Micro USB 2.0 port and the reset button.



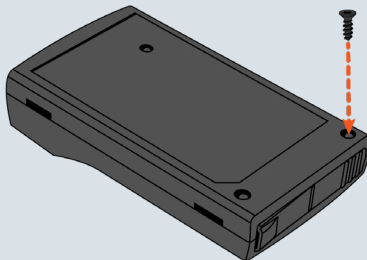
2. Slide the cover to the right to reveal the SIM card slot.



3. Insert the SIM card into the slot with the gold SIM conductor pins facing down. Push the SIM card in until it locks in place. To remove the SIM card, push it in again and it will unlock.



4. Slide the cover back to the left and then push the right side closed.
5. To lock the protective cover, fasten the provided Torx screw into the hole below the SIM card slot on the bottom of the device using a T6 Torx driver.



Power and serial communication options

The NTC-100 serial modem may be connected and powered by:

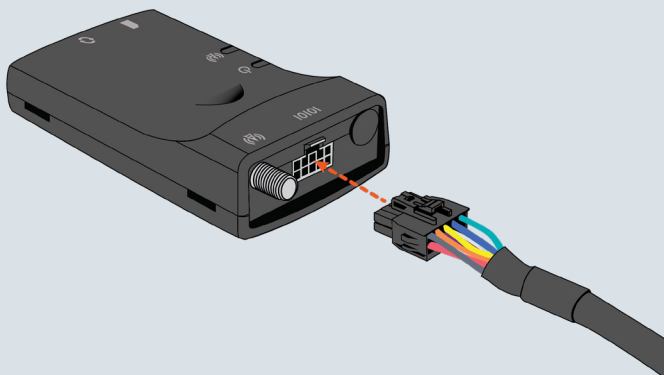
- The 10-pin power/data connector using the included Y-cable.

OR

- The built-in 5V Micro USB socket (USB cable not included)

Powering the NTC-100 via Y-cable

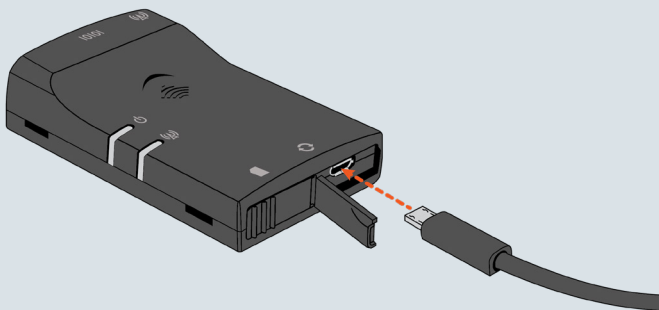
The included Y-cable features a breakout cable providing a DC Jack. Connect the Serial plug to a Serial port on your device (e.g. computer) and then connect a 4.5-36V power source to the DC Jack to power the unit. Connect the 10-pin plug into the 10-pin connector on the NTC-100 serial modem.



Powering the NTC-100 serial modem via 5V Micro USB socket

The NTC-100 serial modem features a USB port which can optionally be used for serial connectivity, terminal emulation or debugging. The USB port enumerates a number of endpoints after the USB port driver is installed.

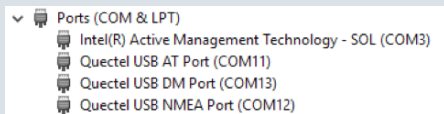
Connect a standard USB to USB Micro Type B cable (not included) between the NTC-100 serial modem and a powered USB port on your device (e.g. computer). The USB cable provides the NTC-100 serial modem with power and an emulated serial port input.



1. For USB port communication, you must install a driver compatible with the NTC-100 serial modem's embedded Quectel BG96 cellular module. The Windows drivers are available from the NTC-100 serial modem product page on the NetComm Wireless website (<https://support.netcommwireless.com/products/NTC-100>).
2. After the download has completed, install the driver by double-clicking on the downloaded file and following the installer prompts.

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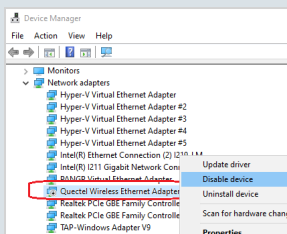
- Open the **Control Panel** and then **Device Manager**. The NTC-100 serial modem appears under **Ports** with three Quectel USB entries.



The COM port used for each port is displayed in brackets next to each port type. For terminal access, take note of the COM port assigned to the **Quectel USB AT Port**. In the screenshot above, it is COM11. For further instructions, see the **Accessing the NTC-100 via terminal emulator** section of this guide.

Important – After plugging in the USB cable, to avoid conflict with the application IP connection process ensure that the ‘Quectel Wireless Ethernet Adapter’ is disabled in the **Windows Device Manager**:

- Navigate to **Device Manager > Network adapters**.
- Right click **Quectel Wireless Ethernet Adapter** in the list.
- Select **Disable device** from the popup menu.



After powering up, the NTC-100 serial modem is ready to establish a serial communication link. See page 12 for instructions on accessing the NTC-100 serial modem via terminal emulator.

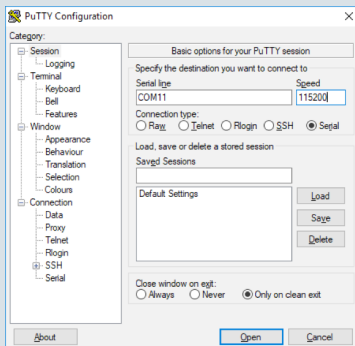
Configuring the NTC-100 via SMS

A full list of SMS commands used to control and configure the NTC-100 are available in the User Guide.

Accessing the NTC-100 via terminal emulator

To access the NTC-100 using a terminal emulator:

1. Using your terminal emulator, create a new connection to the COM port assigned to the connected serial port, with the bitrate set to 115200.



2. If you are accessing the NTC-100 via the USB interface, type **AT** and Press Enter in the terminal window that appears. If the NTC-100 is connected, it replies with **OK**. Note that you can access only module AT commands from the USB port.

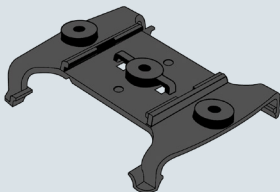
If you are accessing the NTC-100 via the Serial Y cable, you are presented with a blank screen. Type **root** then press Enter. At the password prompt, type **admin** then press Enter. When logged in, type **AT**. The NTC-100 replies with **OK**. From the Serial interface, you can access module AT commands and custom application AT commands.

Further AT commands are available in the supporting documentation on the NetComm Wireless Support website at

<https://support.netcommwireless.com/products/NTC-100>

Mounting options

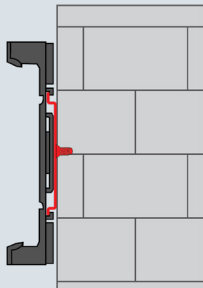
The NTC-100 serial modem can be mounted on a wall, DIN rail or a pole by using the mounting bracket. The mounting bracket is made from polyamide, a flexible material.



DIN rail mounting

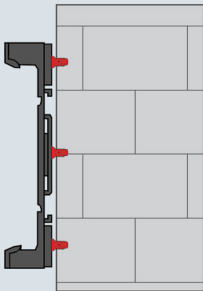
The NTC-100 serial modem mounting bracket has been designed to fit a TS 35 Type-O DIN rail with a 25mm core.

Bend the mounting bracket at the bend line so that the ridges are able to 'hold' onto the DIN rail edges as per the diagram below. Alternatively, if the end of the DIN rail is open, you can slide the bracket on to the rail. You also have the option of securing the mounting bracket further by screwing it into place on the rail.



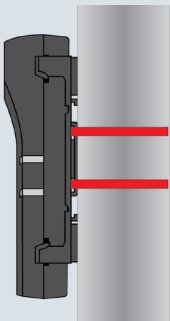
Wall mounting

Select the location where you would like to attach the NTC-100 serial modem. Attach the mounting bracket to the chosen wall or ceiling by using the 3 screw holes (screws not included).



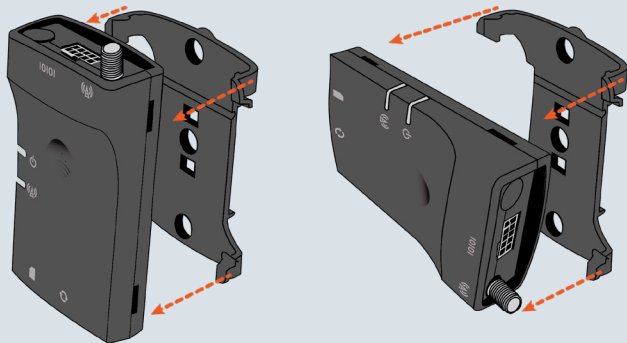
Pole mounting

Use cable ties (max 4mm width) through the holes on the mounting bracket to affix the NTC-100 to a pole.



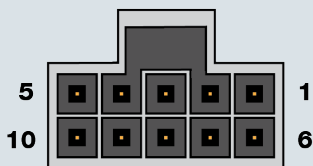
Inserting the NTC-100 into the mounting bracket

Once the bracket is attached to the DIN rail, wall or pole, snap the NTC-100 into the mounting bracket to hold it in place. The NTC-100 can be snapped into the mounting bracket in two ways, as shown below.



Pin outs

10-pin power/data connector



Note: The image to the left depicts the NanoFit header on the NTC-100 as viewed from the side of the device.

Pin map

Nano-Fit Pin	DE-9 Pin	Wire Colour	RS-232	RS-485	RS-422
1	2	Green	RXD	A	RD-
2	1	Blue	DCD	B	RD+
3	7	Yellow	RTS		
4	9	Orange	RI		
5	5	Black	GND	GND	GND
6	4	Brown	DTR		TD-
7	3	White	TXD		TD+
8	6	Purple	DSR		
9	8	Grey	CTS		
10	-	Red	DC In	DC In	DC In

USB

1. VUSB 5V
2. USB Data N
3. USB Data P
4. USB ID
5. GND

LED indicators

The NTC-100 serial modem uses two LEDs to display the current system and connection status.

Status LED

Status	Description
Off	The power is off.
Flashing Red	Device error.
Flashing Green	The NTC-100 is powering up.
Solid Green	The NTC-100 is powered up and ready for connection.

Network LED

Functions

Status	Description
Off	No signal.
Intermittently Red (on 30 seconds, off 30 seconds)	No SIM detected.
Blinking Red (displays red once every 2 seconds)	SIM detected but not connected.
Blinking Red, Amber or Green	Registered to network with poor (red), medium (amber) or strong (green) signal strength.
Flashing Red, Amber or Green	Data being transferred with poor (red), medium (amber) or strong (green) signal strength.

Signal Strength

To check the precise signal strength reading on the device, from the terminal, enter the following command:

AT+QCSQ

The NTC-100 replies with the following syntax:

+QCSQ:

<sysmode>,[,<value1>[,<value2>[,<value3>[,<value4>]]]]

OK

The value listed for <value2> is the RSRP and the value most often used to measure signal strength. Also, see the table below for detail on the signal strength ranges and the LED indicator colours for those ranges.

Network LED Colour	Description	CAT-M1 / CAT NB1 Signal Strength Range <value2>
Green	High	RSRP > -90 dBm
Amber	Medium	-90 dBm ≥ RSRP > -100 dBm
Red	Low	-120 dBm < RSRP ≤ -100 dBm
OFF	Poor to no signal	RSRP ≤ -120 dBm or no sync to signal

Accessories

Additional cables are available for purchase separately. Contact your NetComm Wireless sales representative to order additional cables. Refer to the table below for the product codes.

Accessory Name	Product Code
Y-Cable (DE-9 female to 10-pin + DC5521 female)	MCBL-00004-000
Straight cable (8P8C to 10-pin)	MCBL-00003-000
Straight cable (10-pin to open cable)	MCBL-00005-000

Regulatory information

FCC regulations

Federal Communications Commission Notice (United States): Before a wireless device model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure.

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorientate 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. FCC Caution: Any changes or modifications not expressly approved by the

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure

Your device contains a transmitter and a receiver. When it is on, it receives and transmits RF energy. When you communicate with your device, the system handling your connection controls the power level at which your device transmits.

- This device meets the government's requirements for exposure to radio waves.
- This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.
- This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. To ensure compliance with RF exposure guidelines the device must be used with a minimum of 20cm separation from the body. Failure to observe these instructions could result in your RF exposure exceeding the relevant guideline limits.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

External antenna (transmitters equipped with detachable antennas)

Any external antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter. Please consult the health and safety guide of the chosen antenna for specific body separation guidelines as a greater distance of separation may be required for high-gain antennas.

Any external antenna gain must meet RF exposure and maximum radiated output power limits of the applicable rule section. The maximum antenna gain for this device as reported to the FCC is:

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FREQUENCY (MHz)	GAIN (dBi)
698 - 798	4.71
824 - 960	3.13
1710 - 2100	3.42
2400 - 2700	4.32

Company Contact Details

Casa Systems, Inc.

100 Old River Road,

Andover, Massachusetts, 01810 USA

www.netcomm.com/contact

Product Details

Product: 4G LTE Cat M1/NB1 Industrial IoT Serial Modem

Model No: NTC-100

IC regulations

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device complies with ISED licence-exempt RSS standard(s). Operation is subject to the following two conditions:

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) this device may not cause interference, and

(1) l'appareil ne doit pas produire de brouillage, et

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

RF Exposure Information (MPE):

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé.

This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

External antenna - RSS-Gen 8.3 (transmitters equipped with detachable antennas)

This radio transmitter has been approved by ISED to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated.

Le présent émetteur radio a été approuvé par ISED pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne.

Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

NTC-100 4G LTE Cat M1/NB1 Industrial IoT Serial Modem

Antenna types / Type d'antennes:

Antenna gain in dBi / Gain d'antenne (en dBi):

FREQUENCY (MHz)	GAIN (dBi)
698 - 798	4.71
824 - 960	3.13
1710 - 2100	3.42
2400 - 2700	4.32

CE Regulation RF Exposure Information (MPE)

This device meets the EU requirements and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on the limitation of exposure of the general public to electromagnetic fields by way of health protection. To comply with the RF exposure requirements, this equipment must be operated in a minimum of 20 cm separation distance to the user.

RF General Information

Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
GSM 900	880-915	925-960	GSM/GPRS: GMSK
DCS 1800	1710-1785	1805-1880	EGPRS: GMSK / 8PSK
LTE	B1: 1920 - 1980 B3: 1710 - 1785 B8: 880 - 915 B20: 832 - 862 B28: 758 - 803	B1: 2110 - 2170 B3: 1805 - 1880 B8: 925 - 960 B20: 791 - 821 B28: 703 - 748	CAT-M1: QPSK, 6QAM NB-IOT: BPSK, QPSK

Maximum RF Power Table

Evaluation Mode	Maximum Average Output Power (dBm)
GSM 900	30.2
DCS 1800	29.1
LTE B1	23.6
LTE B3	23.1
LTE B8	23.4
LTE B20	23.1
LTE B28	22.9



WEEE Regulation

Waste Electrical and Electronic Equipment (WEEE)

This symbol means that according to local laws and regulations your product and/or its battery shall be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. Proper recycling of your product will protect human health and the environment.

Simplified EU DoC

Hereby, Netcomm Wireless Ltd declares that the radio equipment type NTC-100 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:
<http://support.netcommwireless.com/doc>

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Product Warranty

For warranty information please visit

<https://support.netcommwireless.com/warranty-info>

Technical Support

For firmware updates or if you have any technical difficulties with your product, please refer to the support section of our website.

<http://support.netcommwireless.com/>



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