NetCommWireless

Quick Start **Guide**

NTC-220 Series
4G LTE Cat 1 Industrial IoT Router

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Quick start guide

This quick start guide is designed to get you up and running quickly with your new NTC-220 Series Router. More advanced set up instructions can be found in the user guide which can be downloaded from **www.netcommwireless.com/product/ntc-220.**

Package contents

The NTC-220 Series package includes:

1 x NetComm NTC-220 Series Router

1 x Quick Start Guide

2 x Cellular antennas

1 x 1.5m Yellow Ethernet cable 8P8C

1 x DIN rail mounting bracket
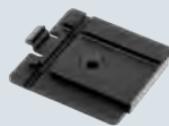
1 x Horizontal DIN rail mounting adapter

1 x Six-way terminal block

Device overview

Reset button

RJ45 Fast
Ethernet port

SIM card slot

Six-way terminal
block connector

Micro USB 2.0
OTG port

Serial port

Main antenna socket

Aux antenna socket

GPS antenna socket

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Item	Description
Aux antenna socket	SMA female connector for auxiliary antenna (receive diversity).
Serial port	Female DE-9 port supporting 9-wire RS-232, RS-485 or RS-422 (software selectable).
GPS antenna socket	SMA female connector for GPS antenna.
Main antenna socket	SMA female connector for main antenna.
Reset button	Press and hold for less than 5 seconds to reboot to normal mode. The LEDs are green and extinguish in sequence to indicate that the router will reboot normally if the button is released during this period. Press and hold for 5 to 15 seconds to reboot to recovery mode. The LEDs are amber and extinguish in sequence to indicate that the router will reboot to recovery mode if the button is released during this period. Press and hold for 15 to 20 seconds to reset the router to factory default settings. The LEDs are red and extinguish in sequence to indicate that the router will reset to factory default settings if the button is released during this period.
SIM card tray slot	The removeable tray houses the SIM card.
Micro USB 2.0 OTG port	Provides connectivity for optional external storage or a USB Ethernet dongle. Supplies up to 0.5A to connected device.
Six-way terminal block connector	Connect power source, ignition and I/O wires here. Power, ignition and I/O wires may be terminated on the supplied terminal block and connected to a power source. Refer to the diagram and table under Step 5 of the Installing your device section for correct wiring of the terminal block. Operates in the 8-40V DC range.
RJ45 Fast Ethernet port	Connect one or several devices via a network switch here.

Sidebar text

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Getting started

Depending on your chosen setup, you may need certain components to configure your device correctly, such as:

- 🛜 An external power supply unit for the NTC-220 Series Router (not included).
- 🛜 A flathead screwdriver for terminating power input wires.
- 🛜 A laptop or PC for advanced configuration.
- 🛜 Additional fasteners and screwdrivers for specific wall or rail mounting.

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Overview of LED indicators

LED Icon	Name	Colour	State	Description
Power	Power		Off	Power off
			Double flash	Powering up
			On	Power on
			On	Power on in recovery mode
			Slow flashing	Hardware error
Network	Network		On	Connected via WWAN
			Blinking[1]	Traffic via WWAN
			Slow flashing	Connecting PDP
			On	Registered network
			Slow flashing	Registered network
			Slow flashing	SIM PIN locked
			Fast flashing	SIM PUK locked
			On	Can't connect

LED Icon	Name	Colour	State	Description
	GPS / Customizable LED Indicator	☐	Off	GPS function disabled
		🟥	On	GPS function is enabled but no satellite is detected.
		☀	Flashing	Satellite detected, acquiring location.
		🟩	On	Satellite detected, location acquired.
	Signal strength	🟩	On	LTE signal
		🟧	On	WCDMA signal
		🟥	On	GSM signal

[1] The term "blinking" means that the LED may pulse, with the intervals that the LED is on and off not being equal. The term "flashing" means that the LED turns on and off at equal intervals.

Installing your device

Step 1: Insert the SIM card

Before inserting the SIM card, examine it for signs of damage or deformation that could prevent it being safely inserted or allowing it to become stuck in the unit. Examine the gold contact point of the SIM for signs of wear or damage that may prevent it from working correctly.

Press the SIM Eject button to eject the SIM card tray. Place the SIM card in the tray and then insert the loaded tray into the SIM card slot with the gold side facing up. The SIM tray should slide easily into the slot, do not force the loaded SIM tray into the slot.

Step 2: Attach the antennas

The NTC-220 Series Router is shipped with caps on the Main, Auxiliary and GPS antenna sockets. To attach the supplied antennas, first remove the antenna socket caps from the Main and Auxiliary antenna sockets by turning them in an anti-clockwise direction, then screw the antennas onto the sockets by turning them in a clockwise direction. Please refer to the **Device overview** section for the antenna socket layout. If you have purchased a GPS antenna, remove the socket cap from the GPS antenna socket and attach the antenna to the socket in the same manner.
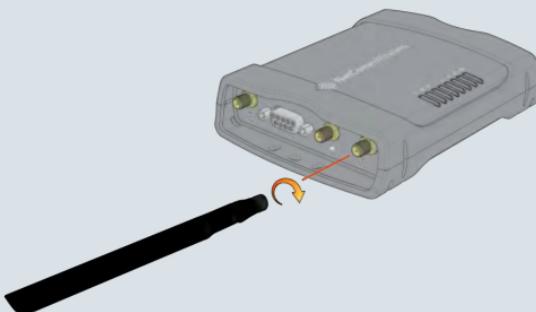
Step 3: Mount the router

Mount your router in a suitable location using the options listed below.

1. Wall mount
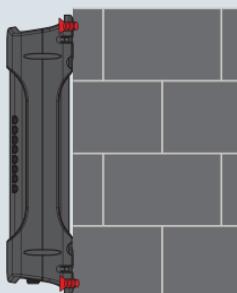
Use a minimum of 2 screws (5mm diameter) through the holes on either side of the device.

DIN rail mounting bracket
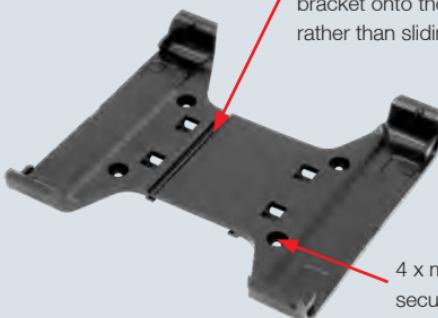
V Bend allows you to snap the DIN bracket onto the middle of a DIN rail rather than sliding it onto the end.

4 x mounting holes allow you to secure the DIN bracket to a wall, using a minimum of 2 screws (3.5mm diameter).

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Horizontal DIN rail mounting adapter

Used in conjunction with the DIN rail mounting bracket, this adapter lets you mount the NTC-220 in a horizontal orientation. With the DIN rail mounting bracket attached to the router, slide the adapter on to the bracket as shown in the image below. You can then mount the device horizontally on a DIN rail. Optionally, you may place a screw (max. 4.5mm diameter) through the centre hole of the adapter so that it doesn't move along the DIN rail.
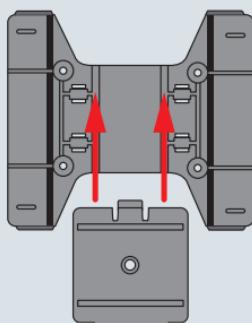
2. Wall mounted via DIN rail bracket

3. Ceiling mount via DIN rail bracket
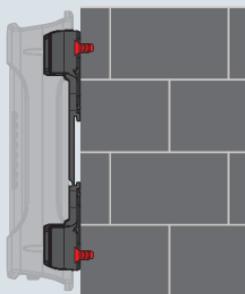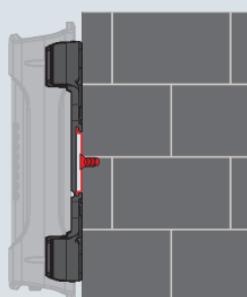
4. DIN rail mount

5. Pole mount using DIN rail bracket

Use cable ties (max. 5mm width) through holes in the mounting bracket
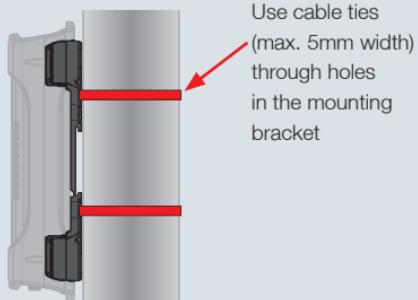
6. Desk mount
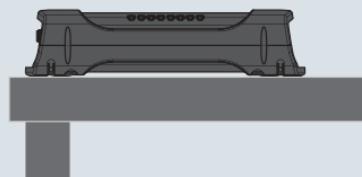
When selecting a location to mount the NTC-220 Series Router, keep in mind that it features two high performance antennas designed to provide optimum signal strength in a wide range of environments. If you find the signal strength is weak, try moving the router to a different place, mounting it differently or changing the orientation of the antennas.

The signal strength LEDs update within a few seconds with a rolling average signal strength reading. When selecting a location for the router, please allow up to 20 seconds for the signal strength LEDs to update before repositioning.

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Step 4: Connect the power and Ethernet cables

Connect power to your router using one of the following options.

DC power via the six-way connector

Remove the attached green terminal block from your router and connect to the router's power socket using a DC power supply, sold separately.

DC power via field terminated power source

If an 8-40V DC power supply is available, you can insert the wires into the supplied terminal block to power your router. Use a flathead screwdriver to tighten the terminal block screws and secure the power wires, making sure that you have correctly wired the terminal block as illustrated below.
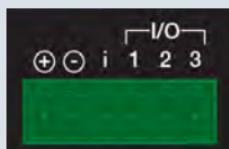
Terminal	Description
⊕	Positive wire for power.
⊖	Ground wire.
i	Dedicated terminal for ignition detection.
I/O	Three terminals used for input/output detection. (Please refer to the User Guide and SDK Guide for more information).

The green power LED on the router lights up when a power source is connected. Attach the supplied yellow Ethernet cable 8P8C to the LAN Ethernet port on your router and the other end to your computer.

Step 5: Access the router's web interface

In your web browser's address bar, enter https://192.168.1.1/

Note – The HTTP protocol is disabled by default, secure HTTP (HTTPS) is the default protocol. HTTP access is available but must be manually enabled.

The web user interface is displayed. There are two system management accounts (Root Manager and Admin) with different management capabilities.

Initialisation

The first time the device is booted (or booted after it is factory reset), the device enters "Configuration mode". In Configuration mode, the router runs a setup wizard which must be completed before it will boot into "Live mode". This is a security feature which enables you to set strong passwords for web root, web user, and Telnet/SSH access or restore a previous configuration from a file.

To complete the setup:

1. Click the Next button on the first dialogue box.

> Welcome to your new NetComm router. The router is now in configuration mode and must be either configured with secure passwords or restored to a previous configuration before it is operational.
>
> Next

2. Enter the factory default password which is printed on the device label then click the Next button.

> To begin using your device, please enter the factory default password.
>
> Next

3. Select whether to configure the router as a new device or to restore a previous configuration backup.

Configure as a new device

a) Select "I want to configure this as a new device" then click the OK button.

Select one of the following options:

◉ I want to configure this as a new device

○ I want to restore my configuration from a previous backup

OK
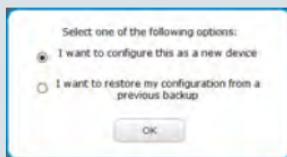
b) In the New Passwords section, enter a strong password in each field. You may configure the same password for all three accounts, but it must meet the security criteria set out below:

✢ The password must be a minimum of eight characters and no more than 128 characters in length.

✢ The password must contain at least one upper case, one lower case character and one number.

✢ The password must contain at least one special character, such as: ` ~ ! @ # $ % ^ & * ( ) - _ = + [{] } \ | ; : ' " , < > / ?

Additionally, the password must satisfy an algorithm which analyses the characters as you type them, searching for commonly used patterns, passwords, names and surnames according to US census data, popular English words from Wikipedia and US television and movies and other common patterns such as dates, repeated characters (aaa), sequences (abcd), keyboard patterns (qwertyuiop) and substitution of numbers for letters.

c) When you have completed all password fields, press the Save button. If the passwords meet the security criteria, they are saved and the router reboots to Live mode automatically. See below for further instructions on logging in.

Restore configuration from a previous backup file

a) Select "I want to restore my configuration from a previous backup" then click the OK button.

b) Click the Choose a file button and locate the backup file on your computer. If the backup file is encrypted, enter the password, then click the Submit button.
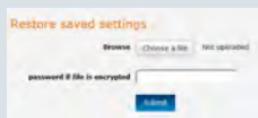
c) The router restores the previous configuration and then reboots. When it has finished rebooting, log in using the new password you previously configured.

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Step 6: Unlock the SIM card

If the inserted SIM card is PIN locked, a pop-up window is displayed informing you that you must unlock the SIM before use.

You must enter your PIN code to unlock and use the SIM.

OK
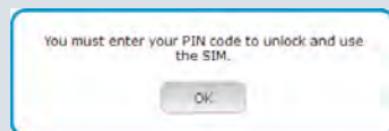
Click the **OK** button. The SIM Security page is displayed.

PIN settings

SIM is PIN locked - remaining attempt(s) 3

Current PIN

Confirm current PIN
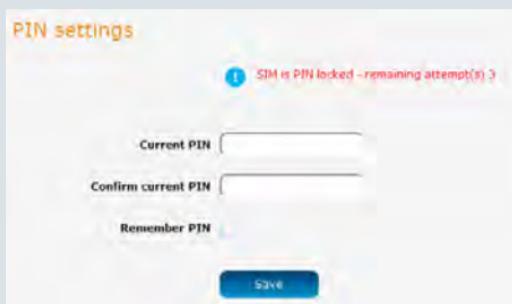
Remember PIN

Save

In the **Current PIN** field, enter the SIM PIN and then enter it again in the **Confirm current PIN** field. If you do not want to enter the PIN code each time the SIM is inserted, select the **Remember PIN** option. Click the **Save** button. After a moment, the router displays "Success! The SIM unlock was successful".

Step 7: Connect to the Internet

If the SIM Status is OK, the NTC-220 Series Router automatically attempts to connect to the Internet by detecting the correct APN and connection details.

If automatic configuration was unsuccessful, you must manually enter the connection details.

To manually configure the connection profile:

1. From the top menu bar, select the **Networking** option.
2. Next to Profile1, click the ✎ button. The Data connection profile settings screen is displayed.
3. Ensure that the **Automatic APN selection** toggle key is set to the **OFF** position.

Automatic APN selection   ON   **OFF**

4. In the **APN** field, enter the APN name that your carrier requires for mobile broadband connection. If required, enter the Username and Password in the **Username** and **Password** fields. Click the **Save** button.

The connection profile is now configured.

Verifying the connection status

Click on the **Status** menu item from the top menu bar. The Status page is displayed. The mobile broadband connection is established successfully if the **Status** field in the **WWAN connection status** section displays **Connected**.

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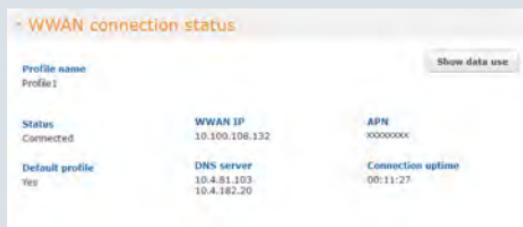
Safety and product care

Electrical safety

Accessories

Only use approved accessories.

Do not connect with incompatible products or accessories.

Connection to a car

Seek professional advice when connecting a device interface to the vehicle electrical system.

Distraction

Operating machinery

Full attention must be given to operating the machinery in order to reduce the risk of an accident.

Driving

Full attention must be given to driving at all times in order to reduce the risk of an accident. Using the device in a vehicle can cause distraction and can lead to an accident. You must comply with local laws and regulations restricting the use of mobile communication devices while driving.

Product handling

You alone are responsible for how you use your device and any consequences of its use.

You must always switch off your device wherever the use of a mobile phone is prohibited. Do not use the device without the clip-on covers attached, and do not remove or change the covers while using the device. Use of your device is subject to safety measures designed to protect users and their environment.

Always treat your device and its accessories with care and keep it in a clean and dust-free place.

Do not expose your device or its accessories to open flames or lit tobacco products.

Do not expose your device or its accessories to liquid, moisture or high humidity.

Do not drop, throw or try to bend your device or its accessories.

Do not use harsh chemicals, cleaning solvents, or aerosols to clean the device or its accessories.

Do not paint your device or its accessories.

Do not attempt to disassemble your device or its accessories, only authorised personnel must do so.

Do not expose your device or its accessories to extreme temperatures. Ensure that the device is installed in an area where the temperature is within the supported operating temperature range of -30°C to +70°C.

Do not use your device in an enclosed environment or where heat dissipation is poor. Prolonged use in such space may cause excessive heat and raise ambient temperature, which will lead to automatic shutdown of your device or the disconnection of the mobile network connection for your safety. To use your device normally again after such shutdown, cool it in a well-ventilated place before turning it on.

Please check local regulations for disposal of electronic products.

Do not operate the device where ventilation is restricted

Installation and configuration should be performed by trained personnel only.

Do not use or install this product near water to avoid fire or shock hazard. Avoid exposing the equipment to rain or damp areas.

Arrange power and Ethernet cables in a manner such that they are not likely to be stepped on or have items placed on them.

Ensure that the voltage and rated current of the power source match the requirements of the device. Do not connect the device to an inappropriate power source.

Small Children

Do not leave your device and its accessories within the reach of small children or allow them to play with it.

They could hurt themselves or others, or could accidentally damage the device.

Your device contains small parts with sharp edges that may cause an injury or which could become detached and create a choking hazard.

Demagnetisation

To avoid the risk of demagnetisation, do not allow electronic devices or magnetic media close to your device for a long time.

Avoid other magnetic sources as these may cause the internal magnetometer or other sensors to malfunction and provide incorrect data.

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Electrostatic discharge (ESD)

Do not touch the SIM card's metal connectors.

Air Bags

Do not place the device in the area near or over an air bag or in the air bag deployment area

Mount the device safely before driving your vehicle.

Emergency & other situations requiring continuous connectivity

This device, like any wireless device, operates using radio signals, which cannot guarantee connection in all conditions. Therefore, you must never rely solely on any wireless device for emergency communications or otherwise use the device in situations where the interruption of data connectivity could lead to death, personal injury, property damage, data loss, or other loss.

Device heating

Your device may become warm during normal use.

Faulty and damaged products

Do not attempt to disassemble the device or its accessory.

Only qualified personnel should service or repair the device or its accessory.

If your device or its accessory has been submerged in water or other liquid, punctured, or subjected to a severe fall, do not use it until you have taken it to be checked at an authorised service centre

Interference

Care must be taken when using the device in close proximity to personal medical devices, such as pacemakers and hearing aids.

Pacemakers

Pacemaker manufacturers recommend that a minimum separation of 15cm be maintained between a device and a pacemaker to avoid potential interference with the pacemaker.

Hearing aids

People with hearing aids or other cochlear implants may experience interfering noises when using wireless devices or when one is nearby.

The level of interference will depend on the type of hearing device and the distance from the interference source, increasing the separation between them may reduce the interference. You may also consult your hearing aid manufacturer to discuss alternatives.

Medical devices

Please consult your doctor and the device manufacturer to determine if operation of your device may interfere with the operation of your medical device.

Hospitals

Switch off your wireless device when requested to do so in hospitals, clinics or health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.

Aircraft

Switch off your wireless device whenever you are instructed to do so by airport or airline staff.

Consult the airline staff about the use of wireless devices on board the aircraft, if your device offers a 'flight mode' this must be enabled prior to boarding an aircraft.

Interference in cars

Please note that because of possible interference to electronic equipment, some vehicle manufacturers forbid the use of devices in their vehicles unless an external antenna is included in the installation.

Explosive environments

Petrol stations and explosive atmospheres

In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as your device or other radio equipment.

Areas with potentially explosive atmospheres include fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles, such as grain, dust, or metal powders.

Blasting caps and areas

Turn off your device or wireless device when in a blasting area or in areas posted turn off "two-way radios" or "electronic devices" to avoid interfering with blasting operations.

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Regulatory compliance

FCC Statement

FCC compliance

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.

FCC regulations

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 device 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.

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 20 cm separation from the body. Failure to observe these instructions could result in your RF exposure exceeding the relevant guideline limits.

External antenna

Any optional external antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or 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:

NANT-00001 Dipole Antenna Gain for NTC-224

Frequency (MHz)	Gain (dBi)
WCDMA Band 2	3.42
WCDMA Band 4	3.28
WCDMA Band 5	3.13
LTE Band 2	3.42
LTE Band 4	3.28
LTE Band 12	4.71

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NANT-00001 Dipole Antenna Gain for NTC-225

Frequency (MHz)	Gain (dBi)
LTE Band 4	3.28
LTE Band 13	4.71

Company Contact Details

Name: NetComm Wireless Inc.
US Address: 1000 Sawgrass Corporate Parkway, Suite 500, Sunrise, Florida 33323, USA
Website: https://netcommwireless.com/contact/general-enquiries

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 Industry Canada 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 device has been tested and meets applicable limits for Radio Frequency (RF) exposure. /

Cet appareil a été testé et répond aux limites applicables en matière d'exposition aux radiofréquences (RF).

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 Industry Canada 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 Industrie Canada 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.

NANT-00001 Dipole Antenna Gain for NTC-224

Antenna types / Types d'antennes: Dipole antenna

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

Frequency (MHz)	Gain (dBi)
WCDMA Band 2	3.42
WCDMA Band 4	3.28
WCDMA Band 5	3.13
LTE Band 2	3.42
LTE Band 4	3.28
LTE Band 12	4.71

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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.

NTC-222

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	EDGE: GMSK / 8PSK
WCDMA	B1: 1920 - 1980 B8: 880 - 915	B1: 2110 - 2170 B8: 925 - 960	WCDMA: BPSK / QPSK HSDPA: 16QAM HSUPA: QPSK
LTE	B1: 1920 - 1980 B3: 1710 - 1785 B7: 2500 - 2570 B8: 880 - 915 B20: 832 - 862	B1: 2110 - 2170 B3: 1805 - 1880 B7: 2620 - 2690 B8: 925 - 960 B20: 791 - 821	QPSK / 16QAM

NTC-222

Maximum RF Power

Frequency (MHz)	Gain (dBi)
GSM 900	36.11
DCS 1800	32.57
WCDMA Band 1	25.78
WCDMA Band 8	26.25
LTE Band 1	25.78
LTE Band 3	25.48
LTE Band 7	25.48
LTE Band 8	26.10
LTE Band 20	25.80

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-222 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.
https://support.netcommwireless.com/

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