



***NovaRoam***<sup>™</sup> ***ED900-CT***  
Mobile Router

**Text Based User Interface Reference  
Manual**

**Revision 1.0**



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## Introduction

NovaRoam firmware release v3.11.2 includes a new text based user interface, which makes configuration possible without requiring the use of a web browser. The text based user interface can be used on any computer that is capable of initiating a telnet session.

This manual is in two sections based on the Operation mode of the NovaRoam:

1. Router Mode
2. Bridge Mode

Detailed descriptions of the configuration options can be found in the product user manual.

If you accidentally enter an incorrect value and wish to make a correction, press the delete key to erase the incorrect value. The backspace key will not erase typed input.

## Connecting to the Text Based User Interface

Before connecting to the NovaRoam, verify that the computer has an IP Address from the same subnet as the NovaRoam to which you will connect.

1. Open a command prompt
2. Enter the following command:

```
C:\>telnet 192.168.200.1
```

**Note:** *192.168.200.1* is the default IP Address for NovaRoam equipment. Your unit may differ. To determine the IP Address of a unit in question, use *NovaFind* software included with the NovaRoam.

## Login page

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1. At the “NovaRoam login” prompt, enter “novaroam”
2. At the “Password” prompt, enter “novaroam”

# Operation Mode: Router

This section describes the configuration parameters that are available when the NovaRoam is configured in Router mode.

## Main menu

The Main menu is used to select the operation mode. Bridge mode should be used in networks that require all devices to be on a single subnet. Router mode should be used when devices belong to different IP subnets.

Configuration Option	Acceptable Values
1. Operation Mode	1. Router mode 2. Bridge mode (default: Router mode)

## Interfaces menu

The Interfaces menu is used to configure the Ethernet, Wireless, and Serial interfaces of the NovaRoam.

### Ethernet Interface menu

The Ethernet Interface menu is used to configure settings related to the Ethernet interface of the NovaRoam. Configurable settings include IP Address, Subnet Mask, and MTU.

Configuration Option	Acceptable Values
1. IP Address	Valid IP Address (default: 192.168.200.1)
2. Subnet Mask	Valid Subnet Mask (default: 255.255.255.0)
3. MTU	576-1500 (default: 1500)
MAC ID	Read-only display of unit MAC Address

### Wireless Interface menu

The Wireless Interface menu is used to configure settings related to the Wireless interface of the NovaRoam. Configurable settings include data rate, network ID, and power level.

Configuration Option	Acceptable Values
1. IP Address	Valid IP Address (default: 192.168.202.1)
2. Subnet Mask	Valid Subnet Mask (default: 255.255.255.0)
MAC ID	Read-only display of unit MAC Address
4. Data Rate	159, 317, 655, 1008 (default: 655)
5. Frequency	905-925 (default: 915)
6. Network Size	1 (Point-to-Point), 2 (Small), 3 (Medium), 4 (Large) (default: 2)
7. ARQ Control	yes, no (default: no)
8. Error Correction	yes, no (default: no)
9. Collision Avoidance	yes, no (default: no)
10. Generate Traffic	yes, no (default: no)
11. Gray Zone Avoidance	yes, no (default: no)
12. NR-900A Compatibility	yes, no (default: no)

## Serial Interface menu

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The Serial Interface menu is used to configure settings related to the Serial interface of the NovaRoam. Configurable settings include baud rate and flow control.

Configuration Option	Acceptable Values
1. Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (default: 4800)
2. Flow Control	1 (None) 2 (Hardware) (default: None)
3. Data Settings	8N1, 7E1, 7O1 (default: 8N1)

Configuration Option	Acceptable Values
4. Port	1024 – 65535, excluding 2914, 3000, and 4334 (default: 6000)
5. Destination	Valid IP Address (default: 192.168.204.1)

## IP Routing menu

The IP Routing configuration page is used to configure static routing or MANET (mesh) routing.

### Routing Mode menu

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The Routing Mode menu is used to configure the NovaRoam as either a static router or a MANET (mesh) router. Static routing supports fixed network topologies, while MANET (mesh) routing provides the ability for networks to form and maintain themselves automatically.

Configuration Option	Acceptable Values
1. Routing Mode	1 (Static) 2 (MANET) (default: MANET)
2. Backhaul (MANET only)	Enable (yes, no) (default: yes)
3. System Role (MANET only)	1 (Mobile) 2 (Fixed Repeater) 3 (Infrastructure Router) (default: Mobile)

### Route Table menu

---

The Route Table menu is used to view the NovaRoam's internal routing table. The Route Table can be modified manually when the NovaRoam is operating in Static routing mode.

Configuration Option	Acceptable Values
1. Add Route	Destination Network, Subnet Mask, Gateway IP Address
2. Add Default	Gateway IP Address
3. Delete Route	Destination Network, Subnet Mask, Gateway IP Address

## MANET menu (*MANET Routing Mode only*)

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The MANET Menu is used to configure the MANET Routing settings. Configurable settings include route timing and default gateway setup.

Configuration Option	Acceptable Values
1. Active Route Timeout	1000-100000 (ms) (default: 3000)
2. Hello Interval	1000-100000 (ms) (default: 1000)
3. Allowed Hello Loss	1-10 (default: 2)
4. Gateway	Enable (yes, no) (default: no/disabled)
5. Gateway Address ( <i>only available if Gateway feature is enabled</i> )	Valid IP Address. The Gateway Address must be on the same subnet as the Ethernet interface of the NovaRoam. (default: 192.168.200.254)
6. Add Wireless Networks ( <i>only available if Gateway feature is enabled</i> )	Destination Network, Subnet Mask (default: none)  <b>Note:</b> The Wireless Networks table should include a list of all Ethernet subnets that are available within the wireless network. The Gateway NovaRoam will act as gateway for all networks contained within the Wireless Networks table. All entries must be added at the same time. Adding a new entry at a later time will overwrite the entire table. Single entries can be added at a later time using the web-based user interface.
7. Delete Wireless Networks ( <i>only available if Gateway feature is enabled</i> )	yes, no

## ARP menu

---

The ARP menu is used to add and remove static ARP (Address Resolution Protocol) entries to the internal NovaRoam ARP table. Most applications do not require the use of static ARP entries.

Configuration Option	Acceptable Values
1. Add ARP Table Entries	IP Address and MAC address. MAC address must be in the format of 00:FF:FF:XX:XX:XX

Configuration Option	Acceptable Values
2. Delete ARP Table Entries	yes (delete all entries), no (do not delete all entries)

## NAT menu

---

The NAT (Network Address Translation) menu is used to add and remove NAT filter entries to the internal NovaRoam NAT table. NAT provides the ability for network devices with private IP Addresses to communicate with public networks, such as the Internet.

Configuration Option	Acceptable Values
1. Add NAT Filter Entries	IP Address, network, or "all", allow/deny
2. Delete all NAT Filter Entries	yes (delete all entries), no (do not delete all entries)

## Backhaul menu (*MANET Routing Mode only*)

---

The Backhaul menu is used to configure parameters related to the backhaul. The Backhaul configuration options are only available when the Routing Mode is configured as MANET and the Backhaul option is enabled on the Routing Mode configuration page. Different options are available depending on which System Role value is selected.

### System Role: Mobile

A System Role value of Mobile should be used for mobile NovaRoams in networks that utilize NovaRoam Clustering Technology™

Configuration Option	Acceptable Values
System Role	Displays the current System Role. The System Role can be configured using the Routing Mode menu
2. Registration Refresh Rate	1-60 (minutes) (default: 5)
3. Registration ACK Timeout	1-254 (seconds) (default: 10)
4. Cluster Drop Time	1-254 (seconds) (default: 20)

### System Role: Fixed Repeater

A System Role value of Fixed Repeater should be used for NovaRoams that are installed solely for the purpose of range extension in networks that utilize NovaRoam Clustering Technology™

Configuration Option	Acceptable Values
System Role	Displays the current System Role. The System Role can be configured using the Routing Mode menu
2. Registration Refresh Rate	1-60 (minutes) (default: 5)
3. Registration ACK Timeout	1-254 (seconds) (default: 10)
4. Cluster Number	1-1023 (default: 1)

### System Role: Infrastructure Router

A System Role value of Infrastructure Router should be used for NovaRoams that are directly connected to a backhaul network via the NovaRoam Cluster Gateway in networks that utilize NovaRoam Clustering Technology™

Configuration Option	Acceptable Values
System Role	Displays the current System Role. The System Role can be configured using the Routing Mode menu
2. Communication Timeout	1-60 (seconds) (default: 30)
3. Cluster Gateway Address	Valid IP Address (default: 192.168.200.100)

## QoS menu

The QoS menu is used to configure the NovaRoams Queue Discipline settings.

Configuration Option	Acceptable Values
1. Queue Discipline	1. (TOS Priority Queuing) 2. (Stochastic Fair Queuing) 3. (Single Real-Time Stream) (default: 1)
2. Average Rate ( <b>Single Real-Time Stream only</b> )	10 – 159 (at 159 Kbps data rate) 10 – 317 (at 317 Kbps data rate) 10 – 655 (at 655 Kbps data rate) 10 – 1008 (at 1008 Kbps data rate) (default: 100)
3. Peak Rate ( <b>Single Real-</b>	10 – 159 (at 159 Kbps data rate)

Configuration Option	Acceptable Values
<i>Time Stream only</i>	10 – 317 (at 317 Kbps data rate) 10 – 655 (at 655 Kbps data rate) 10 – 1008 (at 1008 Kbps data rate) (default: 100)
4. Filter on Type ( <i>Single Real-Time Stream only</i> )	<ol style="list-style-type: none"> <li>1. Source Address (valid IP Address)</li> <li>2. Destination Address (valid IP Address)</li> <li>3. Any Source Port (0-65535)</li> <li>4. Any Destination Port (0-65535)</li> <li>5. UDP Source Port (0-65535)</li> <li>6. UDP Destination Port (0-65535)</li> <li>7. TCP Source Port (0-65535)</li> <li>8. TCP Destination Port (0-65535)</li> <li>9. TOS Field (0-255)</li> <li>10. Protocol Field (0-255)</li> <li>11. ICMP Message Type (0-255)</li> <li>12. ICMP Message Code (0-255)</li> </ol>
5. Filter on Value ( <i>Single Real-Time Stream only</i> )	<p>The Filter on Value will vary depending on which Filter on Type is selected.</p> <p><b>Note:</b> TOS Field values are often described as hexadecimal values. Hexadecimal values must be converted to decimal values prior to being entered as a Filter on Value. For example, a hexadecimal value of 0x02 should be entered as a decimal value of 2.</p>

## Security menu

The Security menu is used to configure settings related to network security. Configurable options include encryption, MAC address filtering, and IP Address filtering.

### Encryption menu

The Encryption menu is used to enable or disable wireless network encryption. All NovaRoams within the network must use the same encryption settings in order to be able to communicate with each other.

Configuration Option	Acceptable Values
1. Enable Encryption	yes, no (default: no)
Pass Phrase	The Pass Phrase can only be changed using the web-based user interface

## MAC Filter menu

---

The MAC Filter menu is used to view or edit the MAC Filter table.

Configuration Option	Acceptable Values
1. Add MAC Filter Entries	Valid MAC address. MAC address must be in the format of 00:FF:FF:XX:XX:XX  <b>Note:</b> All entries must be added at the same time. Adding a new entry at a later time will overwrite the entire table. Single entries can be added at a later time using the web-based user interface.
2. Delete MAC Filter Entries	yes, no

## IP Filter menu

---

The IP Filter menu is used to view or edit the IP Filter table.

Configuration Option	Acceptable Values
1. Add IP Filter Entries	Valid IP Address or subnet  <b>Note:</b> All entries must be added at the same time. Adding a new entry at a later time will overwrite the entire table. Single entries can be added at a later time using the web-based user interface.
2. Delete all IP Filter Entries	yes, no

## Admin menu

The Admin menu can be used to change the NovaRoam Name, update firmware, reset to defaults, as well as conduct several other administrative tasks.

## System menu

---

The System menu is used to perform general system changes, including renaming the NovaRoam and resetting it to factory default settings.

Configuration Option	Acceptable Values
1. NovaRoam Name	Name consisting of letters and numbers. The &, =, #, and % characters are not allowed. (default: NovaRoam)
Running Time	This read-only field displays the time since the NovaRoam has last been rebooted.
File System Version	This read-only field displays the current version of the file system
Kernel Version	This read-only field displays the date code for the current kernel version
2. Reset Defaults	yes, no
3. Reboot	yes, no

## Password menu

---

The Password menu is used to change the password that is required to access the NovaRoam using the text based user interface. Changing the password using the text based user interface does not change the web-based user interface password. The NovaRoam must be rebooted for the password change to take effect.

Configuration Option	Acceptable Values
1. Enter new password	Requires 5 – 8 characters and a combination of upper and lower case letters and numbers (default: novaroam)

## Statistics menu

The Statistic menu can be used to view statistics, including Ethernet, Wireless, and MANET Routing.

## Firmware menu

The Firmware menu is used to upgrade firmware.

Prior to upgrading firmware, you must first use FTP to put a copy of the target firmware file on the NovaRoam. The following procedure details how to do this:

- Move a copy of the firmware file you are testing to the C:\ directory of your computer
- Open a command prompt
- Type “cd \”

- Type `ftp 192.168.200.1` (replace “192.168.200.1” with the current IP Address of the NovaRoam you wish to upgrade)
- At the “User (192.168.200.1:(none)): ” prompt, type “novaroam”
- At the “Password: “ prompt, type “novaroam”
- Type “put *filename* nr.bin”, where *filename* represents the name of the firmware file. You should receive the following feedback with in a minute or two:

```
200 PORT command successful.
150 Opening BINARY mode data connection for 'nr.bin'.
226 Transfer complete.
ftp: 6072756 bytes sent in 34.00Seconds 178.61Kbytes/sec.
```

- Type “quit” to end the FTP session

Configuration Option	Acceptable Values
1. Upgrade Firmware	yes, no

Once the firmware upgrade is initiated, the upgrade process will go through several steps and provide feedback during each step:

```
Reading File
Verifying Integrity.....
Erasing File System.....
Writing File System.....
Erasing Kernel.....
Writing Kernel.....
```

**Note:** At the conclusion of the upgrade process the NovaRoam will automatically reboot.

# Operation Mode: Bridge

This section describes the configuration parameters that are available when the NovaRoam is configured in Bridge mode.

## Main menu

The Main menu is used to select the operation mode. Bridge mode should be used in networks that require all devices to be on a single subnet. Router mode should be used when devices belong to different IP subnets.

Configuration Option	Acceptable Values
1. Operation Mode	1. Router mode 2. Bridge mode (default: Router mode)

## Interfaces menu

The Interfaces menu is used to configure the Ethernet and Serial interfaces of the NovaRoam.

### Bridge Interface menu

The Ethernet Interface menu is used to configure settings related to the Bridge interface of the NovaRoam. Configurable settings include IP Address, data rate, network ID, and power level.

Configuration Option	Acceptable Values
1. IP Address	Valid IP Address (default: 192.168.200.1)
2. Subnet Mask	Valid Subnet Mask (default: 255.255.255.0)
MAC ID	Read-only display of unit MAC Address
4. MTU	576-1500 (default: 1500)
5. Date Rate	159, 317, 655, 1008 (default: 655)
6. Frequency	905-925 (default: 915)
7. Network Size	1 (Point-to-Point), 2 (Small), 3 (Medium), 4 (Large) (default: 2)

Configuration Option	Acceptable Values
8. ARQ Control	yes, no (default: no)
9. Error Correction	yes, no (default: no)
10. Collision Avoidance	yes, no (default: no)
11. Spanning Tree	yes, no (default: no)
12. Generate Traffic	yes, no (default: no)
13. NR-900A Compatibility	yes, no (default: no)

## Serial Interface menu

---

The Serial Interface menu is used to configure settings related to the Serial interface of the NovaRoam. Configurable settings include baud rate and flow control.

Configuration Option	Acceptable Values
1. Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (default: 4800)
2. Flow Control	1 (None) 2 (Hardware) (default: None)
3. Data Settings	8N1, 7E1, 7O1 (default: 8N1)
4. Port	1024 – 65535, excluding 2914, 3000, and 4334 (default: 6000)
5. Destination	Valid IP Address (default: 192.168.204.1)

## QoS menu

The QoS menu is used to configure the NovaRoams Queue Discipline settings.

Configuration Option	Acceptable Values
1. Queue Discipline	1. (TOS Priority Queuing) 2. (Stochastic Fair Queuing) 3. (Single Real-Time Stream) (default: 1)
2. Average Rate ( <i>Single Real-Time Stream only</i> )	10 – 159 (at 159 Kbps data rate) 10 – 317 (at 317 Kbps data rate) 10 – 655 (at 655 Kbps data rate) 10 – 1008 (at 1008 Kbps data rate) (default: 100)
3. Peak Rate ( <i>Single Real-Time Stream only</i> )	10 – 159 (at 159 Kbps data rate) 10 – 317 (at 317 Kbps data rate) 10 – 655 (at 655 Kbps data rate) 10 – 1008 (at 1008 Kbps data rate) (default: 100)
4. Filter on Type ( <i>Single Real-Time Stream only</i> )	1. Source Address (valid IP Address) 2. Destination Address (valid IP Address) 3. Any Source Port (0-65535) 4. Any Destination Port (0-65535) 5. UDP Source Port (0-65535) 6. UDP Destination Port (0-65535) 7. TCP Source Port (0-65535) 8. TCP Destination Port (0-65535) 9. TOS Field (0-255) 10. Protocol Field (0-255) 11. ICMP Message Type (0-255) 12. ICMP Message Code (0-255)
5. Filter on Value ( <i>Single Real-Time Stream only</i> )	The Filter on Value will vary depending on which Filter on Type is selected.  <b>Note:</b> TOS Field values are often described as hexadecimal values. Hexadecimal values must be converted to decimal values prior to being entered as a Filter on Value. For example, a hexadecimal value of 0x02 should be entered as a decimal value of 2.

## Security menu

The Security menu is used to configure settings related to network security. Encryption is the only configurable security option when using Bridge mode.

## Encryption menu

---

The Encryption menu is used to enable or disable wireless network encryption. All NovaRoams within the network must use the same encryption settings in order to be able to communicate with each other.

Configuration Option	Acceptable Values
1. Enable Encryption	yes, no (default: no)
Pass Phrase	The Pass Phrase can only be changed using the web-based user interface

## Admin menu

The Admin menu can be used to change the NovaRoam Name, update firmware, reset to defaults, as well as conduct several other administrative tasks.

## System menu

---

The System menu is used to perform general system changes, including renaming the NovaRoam and resetting it to factory default settings.

Configuration Option	Acceptable Values
1. NovaRoam Name	Name consisting of letters and numbers. The &, =, #, and % characters are not allowed. (default: NovaRoam)
Running Time	This read-only field displays the time since the NovaRoam has last been rebooted.
File System Version	This read-only field displays the current version of the file system
Kernel Version	This read-only field displays the date code for the current kernel version
2. Reset Defaults	yes, no
3. Reboot	yes, no

## Password menu

---

The Password menu is used to change the password that is required to access the NovaRoam using the text based user interface. [Changing the password using the text based user interface](#)

does not change the web-based user interface password. The NovaRoam must be rebooted for the password change to take effect.

Configuration Option	Acceptable Values
1. Enter new password	Requires 5 – 8 characters and a combination of upper and lower case letters and numbers (default: novaroam)

## Statistics menu

The Statistic menu can be used to view statistics, including Ethernet and Wireless statistics.

## Firmware menu

The Firmware menu is used to upgrade firmware.

Prior to upgrading firmware, you must first use FTP to put a copy of the target firmware file on the NovaRoam. The following procedure details how to do this:

- Move a copy of the firmware file you are testing to the C:\ directory of your computer
- Open a command prompt
- Type “cd \”
- Type [ftp 192.168.200.1](ftp://192.168.200.1) (replace “192.168.200.1” with the current IP Address of the NovaRoam you wish to upgrade)
- At the “User (192.168.200.1:(none)): prompt, type “novaroam”
- At the “Password: “ prompt, type “novaroam”
- Type “put *filename* nr.bin”, where *filename* represents the name of the firmware file. You should receive the following feedback with in a minute or two:

```
200 PORT command successful.
150 Opening BINARY mode data connection for 'nr.bin'.
226 Transfer complete.
ftp: 6072756 bytes sent in 34.00Seconds 178.61Kbytes/sec.
```

- Type “quit” to end the FTP session

Configuration Option	Acceptable Values
1. Upgrade Firmware	yes, no

Once the firmware upgrade is initiated, the upgrade process will go through several steps and provide feedback during each step:

Reading File  
Verifying Integrity.....  
Erasing File System.....  
Writing File System.....  
Erasing Kernel.....  
Writing Kernel.....

**Note:** At the conclusion of the upgrade process the NovaRoam will automatically reboot.

## **Nova Engineering, Inc.**

5 Circle Freeway Drive  
Cincinnati, OH 45246 USA

**1-800-341-NOVA (6682)**

+1-513-642-3000

FAX +1-513-642-3300

[www.novaroam.com](http://www.novaroam.com)

[info@novaroam.com](mailto:info@novaroam.com)

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