

Quick Installation Guide

WaveKROM Backhaul



Package Contents:

- Two WaveKROM Backhaul
- Two Mounting brackets (include: 2 Wall/ Pole mounting system and 4 screw nuts)
- Two PoE Injectors
- Two Power Cables
- Two RJ45 Waterproof Connector System
- CD-ROM

NetKrom

1. Hardware Installation

Warnings

- Do not work on the system or connect or disconnect cables during periods of lightning activity.
- NETKROM shall not be liable for incidental or consequential damages resulting from the furnishing, performance, or use of this manual.
- Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death.
- Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
- To meet regulatory restrictions, the radio and the external antenna must be professionally installed. The network administrator or other IT professional responsible for installing and configuring the unit must be a suitable professional installer. Following installation, access to the unit should be password protected by the network administrator to maintain regulatory compliance.
- The WaveKROM Backhaul and PoE injector can be damaged by incorrect power application. Read and carefully follow the installation instructions before connecting the system to its power source.

Package contents

Take a moment to ensure you have all of the following parts in your Outdoor Waterproof Unit installation kit before you begin installing the product. If any parts are missing, please contact your local vendor or contact us, please see the contact information in [Section 6](#).



BH-1000



BH-1000-C

Setup Requirements

Before starting, please verify that the following is available:

- CAT5/5e or FTP Outdoor Ethernet cable (from the WaveKROM Backhaul to PoE Injector)
- At least one computer is installed with the NNMS and a wired or wireless network interface adapter
- TCP/IP protocol is installed and IP address parameters are properly configured on all your network's nodes

Important!

- Configure and verify the WaveKROM Backhaul operations first before you mount the unit in a remote location.
- You may need to install a lightning arrester to protect your WaveKROM Backhaul from lightning.
- For choosing the best location for your WaveKROM Backhaul choose an elevated location where trees, buildings and large steel structures will not obstruct the antenna signals and which offers maximum line-of-sight propagation with the users.
- Select an appropriate antenna to improve range and/or coverage. The WaveKROM Backhaul also lets you fine-tune parameters such as the transmit power to achieve the best results.

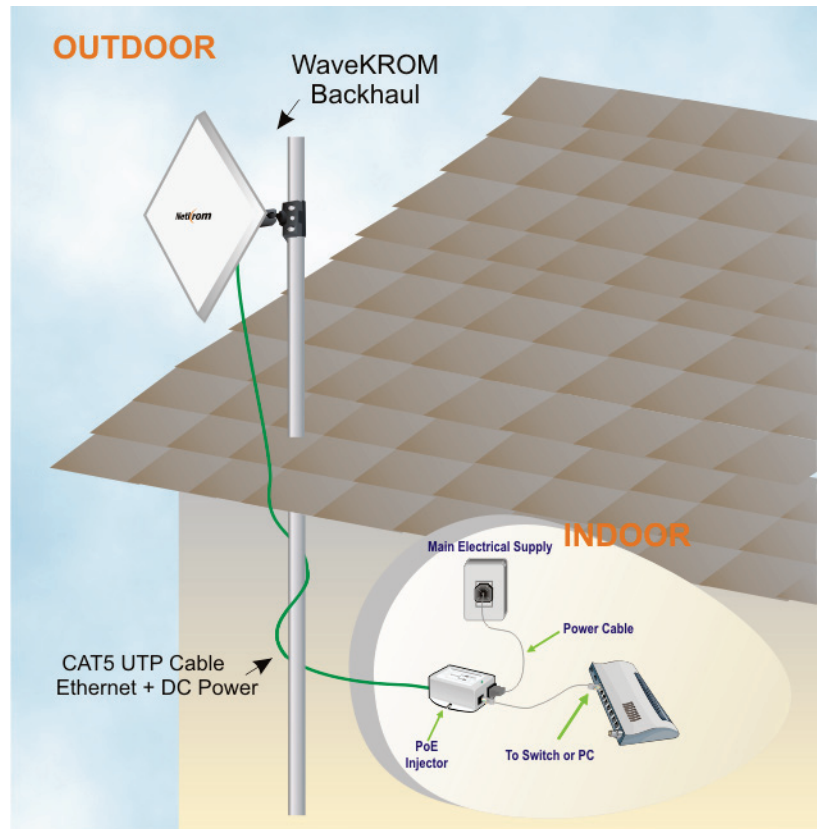


WaveKROM Backhaul Installation

Step 1:

Connect your UTP or FTP Outdoor cat.5 Ethernet cable with waterproof connector to the RJ-45 connector on the WaveKROM Backhaul. Then connect the other end of the cable to the PoE injector.

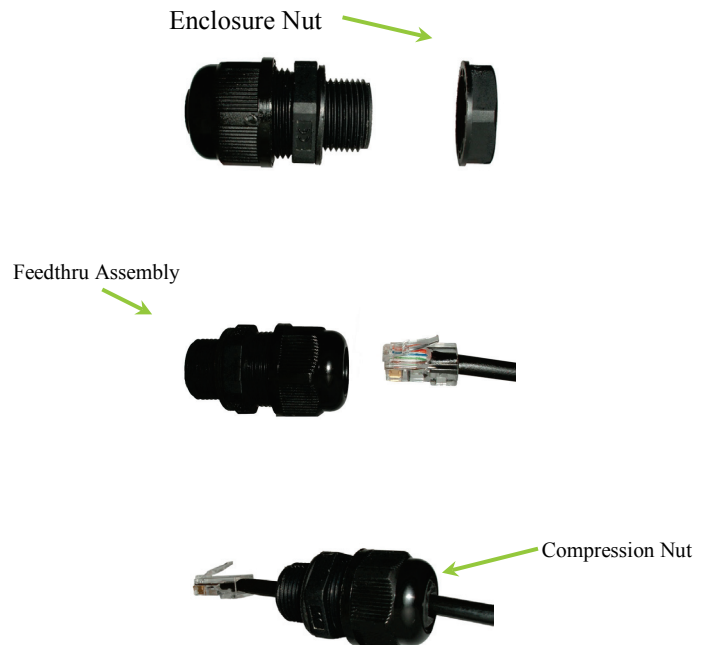
For the Netkrom PoE, the recommended length of the RJ45 Category 5 cable is up to 260 feet or 80 meters.



1.- Remove the thin enclosure nut from the feedthru assembly. This can be discarded. Loosen the compression nut completely

2.- Insert the RJ45 connector thru the feedthru assembly

3.- Tighten the compression nut loosely feedthru assembly



4.- Screw the entire feedthru assembly into the RJ45-ECS housing which is already mounted in the enclosure. There should be a rubber gasket between the two assemblies. Tighten the feedthru assembly to create a seal.

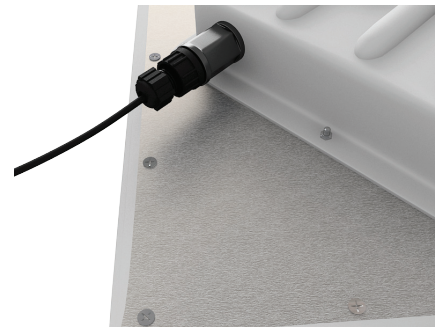
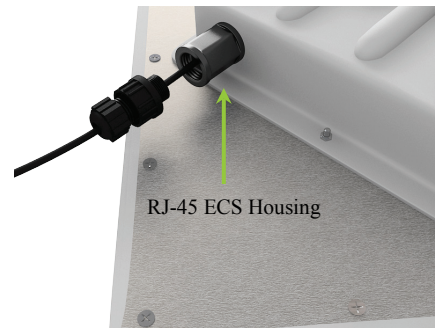
5.- The final step is to tighten the compression nut until the gaskets are tight around the Cat5 cable. Always push the cable toward the connector while tightening to ensure good strain relief of cable to connector.

Step 2: (Only in case of the BH-1000-C)

Connect the external antenna to the N Female connector of the WaveKROM Backhaul.

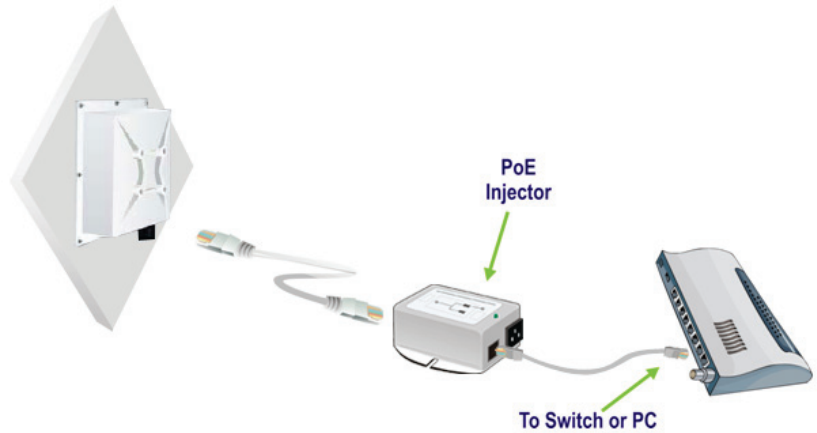
Screw in the Coaxial cable connector correctly into the antenna connector (N-Female) located on the WaveKROM Backhaul casing.

Make sure the former line is properly done and cover the N connectors with an insulating tape.



Step 3

From the PoE injector connect one cat.5 Ethernet cable to the WaveKROM Backhaul and another cat.5 cable to a switch or PC.



Step 4

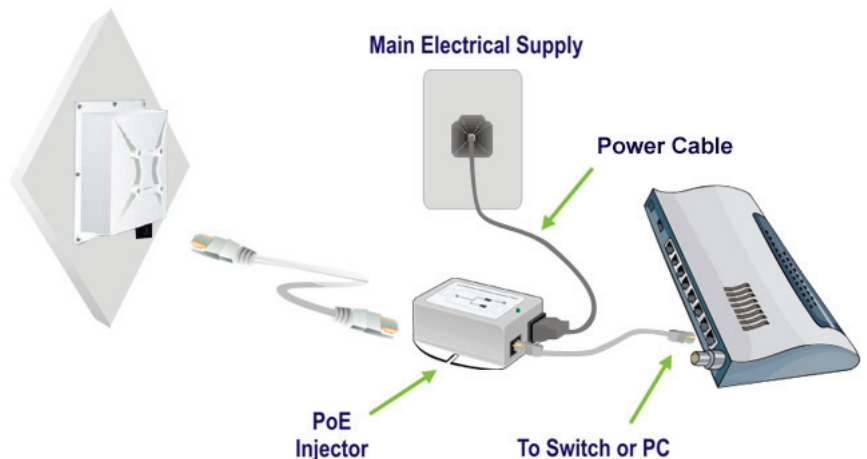
Connect the power cable supplied in the Netkrom PoE kit to the main electrical supply and the power plug into the socket of the injector.

Now, turn on your power supply. Notice that the POWER LED has lighted up.

This indicates that the WaveKROM Backhaul is receiving power through the Netkrom PoE Injector and that connection between your Wireless Radio and your network has been established.

Note:

Please use the PoE injector provided in the package. Using a PoE with a different voltage rating will damage this product.



Mounting the WaveKROM Backhaul

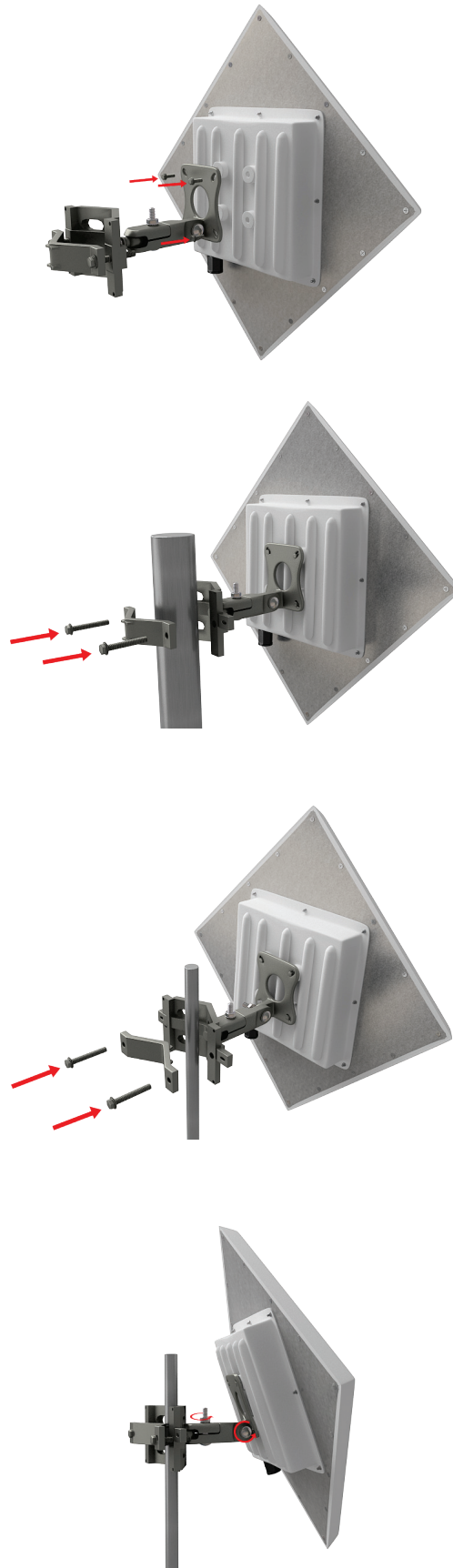
The WaveKROM Backhaul device can be mounted on the pole or tower as shown in following:

1.- Attach the mounting bracket to the back of the radio using the four hex screws provided. (Do not over tighten the screws.)

Note: The bracket in the illustration side shows the normal orientation which allows the wireless unit to be pointed up towards the base station antenna. However, if you live somewhere that would require you pointing the device down towards the base station antenna (for example, you are on the side of a mountain in view of the base station antenna below), reverse the bracket so the Netkrom wireless radio Unit can be “tilted” downward when you aim the WaveKROM Backhaul in a later step

2. - You can use the pipe bracket assembly for either thin or thick poles by just inverting the position of one of the elements as it shown on the right.

3. - Mount the WaveKROM Backhaul to the top of the pipe or other support and point the WaveKROM Backhaul in the approximate direction of the base station antenna, then hand-tighten the nuts on the mounting system.



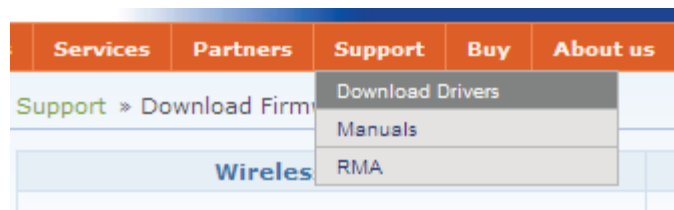
2. NETKROM NMS

NETKROM Network Management System (NMS) is a java based graphical user interface application, running on any operating system, providing ability to manage the wireless device remotely over the IP network. Its main purpose is to serve as a network tool for administrating and monitoring the wireless device. The NMS allows the user to setup all important hardware and software parameters of the device according to the user's requirements. Moreover, it has the ability to display information for data flow, device status, and event logging.

Installing The NMS

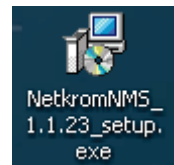
Step 1

Please visit <http://www.netkrom.com> and click on tab Support and click on Download Drivers. Download the latest version of the Netkrom Network Manager.



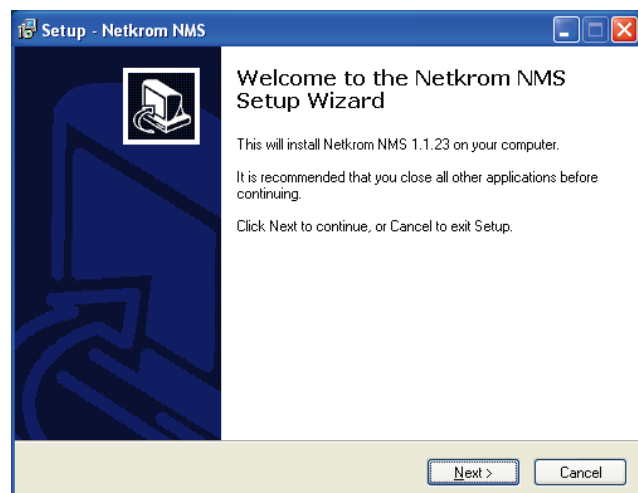
Step 2

After the download is completed, run the NMS installer.



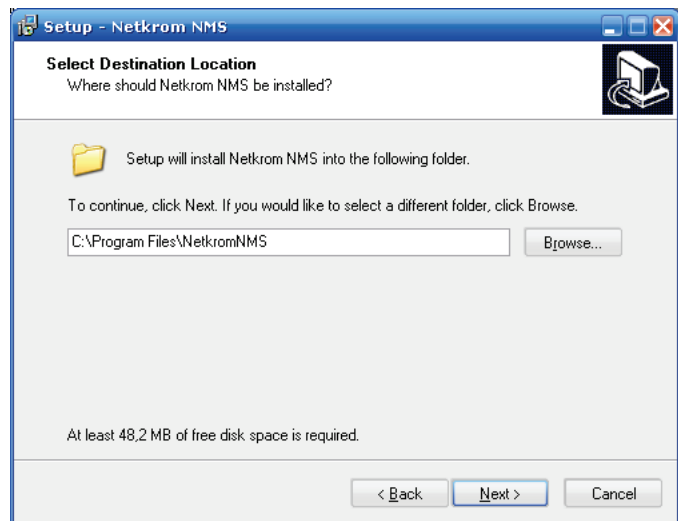
Step 3

Follow the wizard installation instructions.



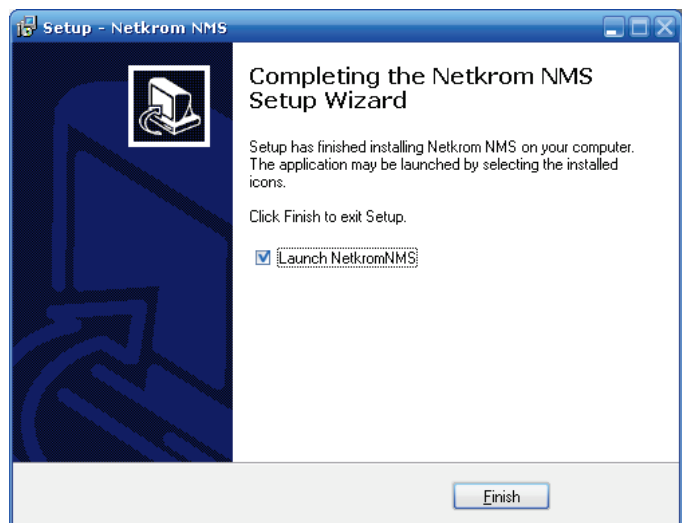
Step 4

Please select the folder the NMS application will be installed and press the next button.



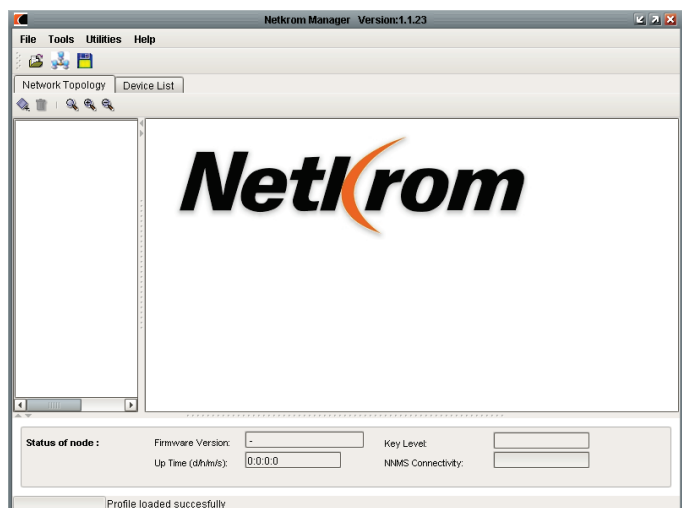
Step 5

Finally, the installation process has finished



Step 6

Now you can run the Netkrom NMS on your system.



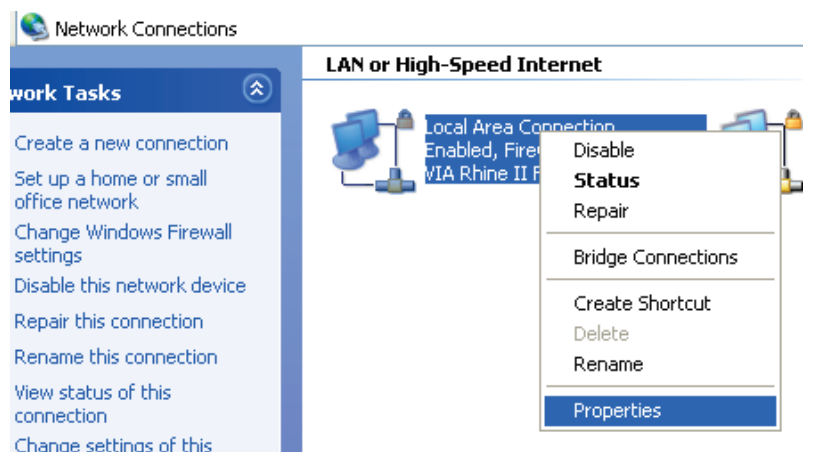
3. PC Configuration

Now you need to establish connection between your PC and the WaveKROM Backhaul. You need to use the Netkrom NMS application to configure the radio; by default the WaveKROM Backhaul has the IP address 192.168.1.3. Therefore, your PC must be in the same network segment as the radio is to get Ethernet connectivity.

Step 1

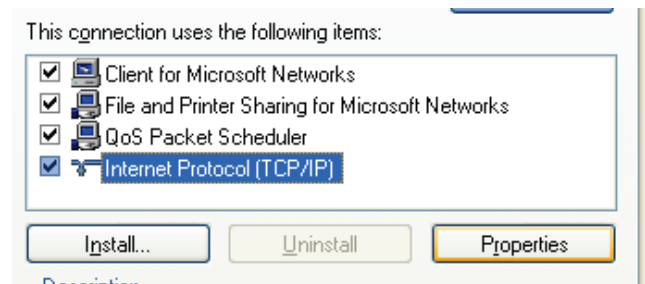
Go to Start button then go to My Network Places and finally click on Network Connections.

Right-Click over your network adapter and select Properties.



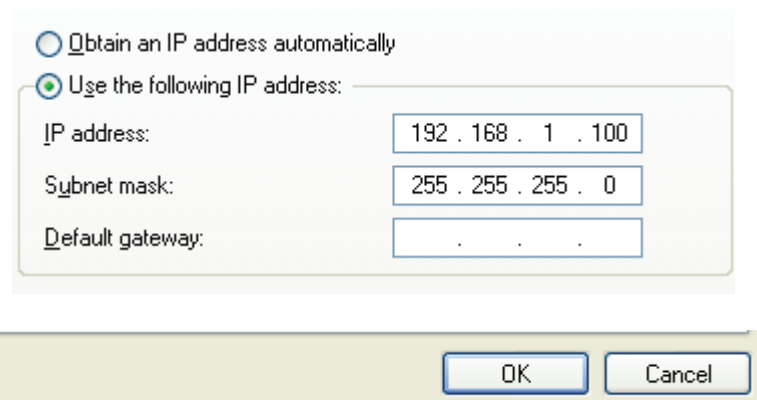
Step 2

Select the Internet Protocol Option and then click in Properties.



Step 3

Now configure the IP Address of your network adapter with an IP in the same IP Network of your WaveKROM Backhaul as it is shown in the picture, you don't need to assign any gateway address.



Then click in OK button and Close button.

4. Common Configurations

Find below typical and basic configurations using our units. For advanced features please refer to the user manual.

Note: The WaveKROM Backhaul comes pre-configured for a *Point to Point transparent bridge connection*. The IP addresses of each unit are: 192.168.1.3 and 192.168.1.4. The following information is based on a radio with default settings (IP address: 192.168.1.3 and no bridges).

Getting Started

In order to start configuring your WaveKROM Backhaul you need to create a new node:

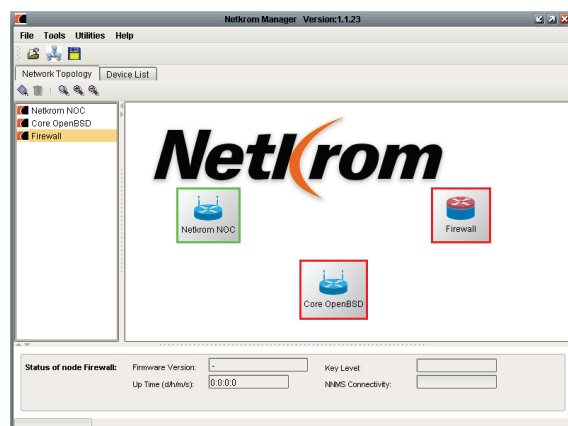
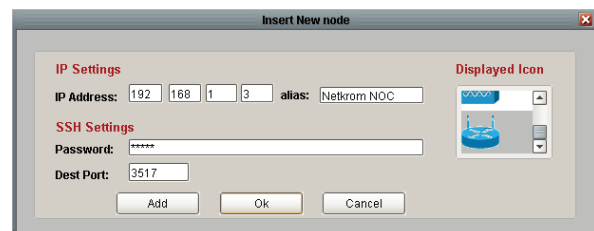
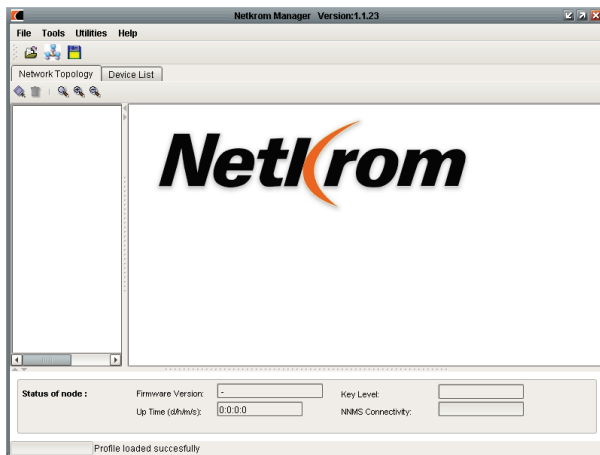
Right click anywhere in the topology map, and then click the Insert new node button.

The default IP address of the radio is: **192.168.1.3**, the default password of the radio is: **admin**, use any alias.

Make sure you have configured in your PC an IP address like 192.168.1.x with netmask 255.255.255.0 and be able to ping the IP address 192.168.1.3. Click the Add button. The icon will appear in the topology map.

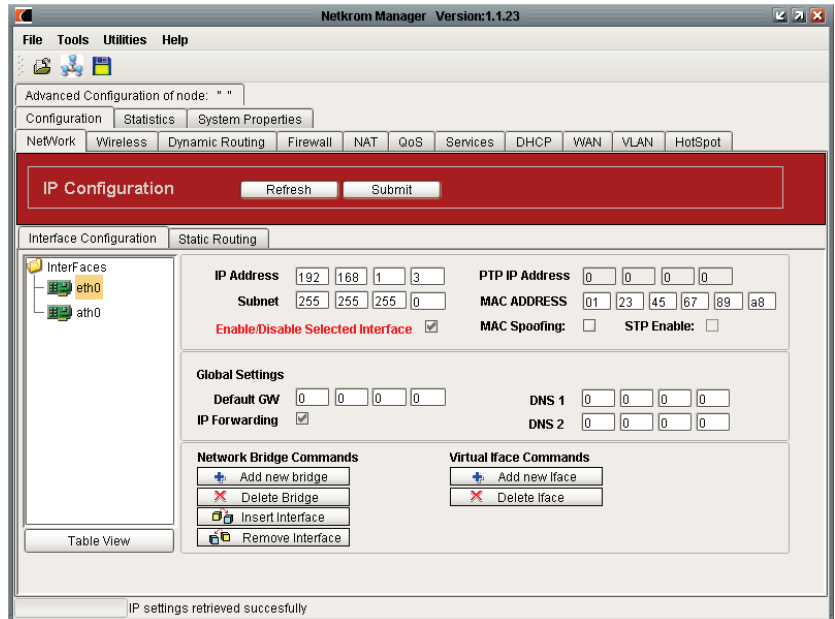
If the newly inserted node has successfully responded to a network probe, a green outline appears around the icon. A red outline indicates the node is not responding.

You can manage and configure a variety of operating parameters of network nodes from the Node Shortcut Menu, which can be accessed by giving a right click any node in the topology map and select the Advance Node Configuration option.

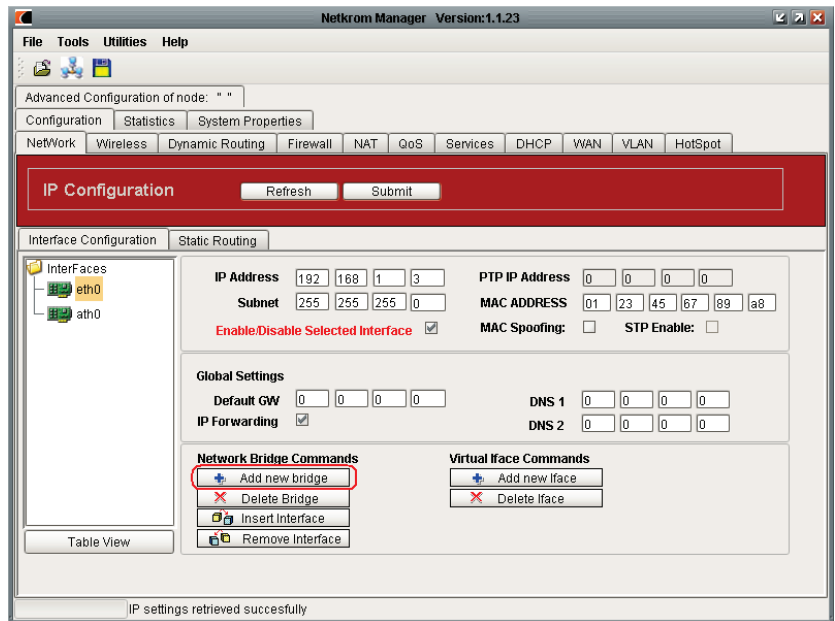


Wireless Bridge Setup

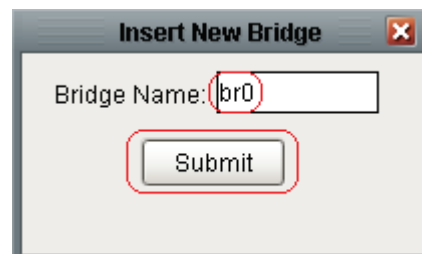
The WaveKROM Backhaul with default settings (By right clicking the node and selecting *Restore Defaults* you can achieve it) is a router, if you want the WaveKROM Backhaul to work as bridge please read this chapter. As soon as you manage to connect to your WaveKROM Backhaul you can start configuring it. Check the picture of the NMS user interface.



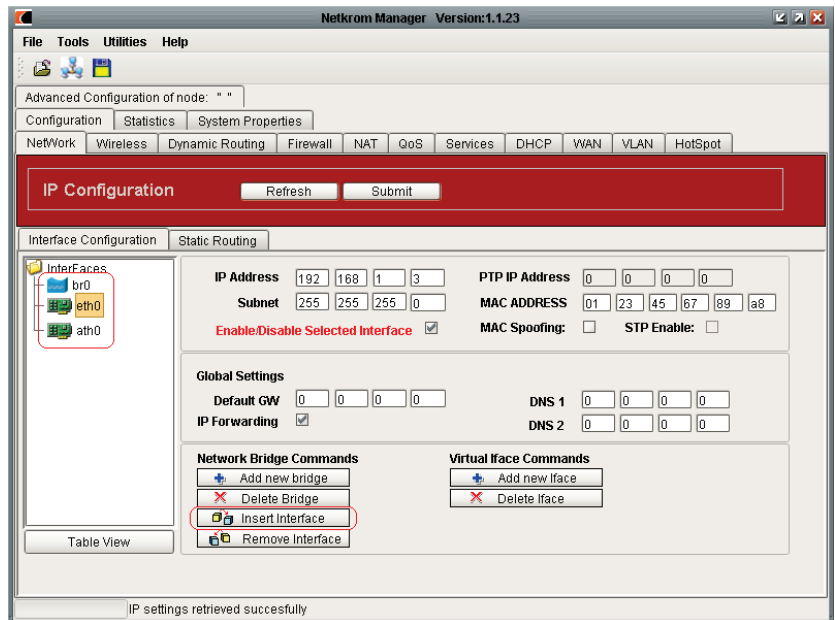
Create a new bridge by clicking in the **Add new bridge** button.



Now assign a name for the bridge interface.



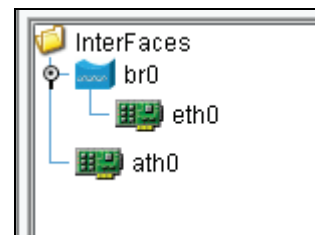
Now you need to insert the interface into the Bridge interface, select interface eth0 and click in the **Insert Interface** button.



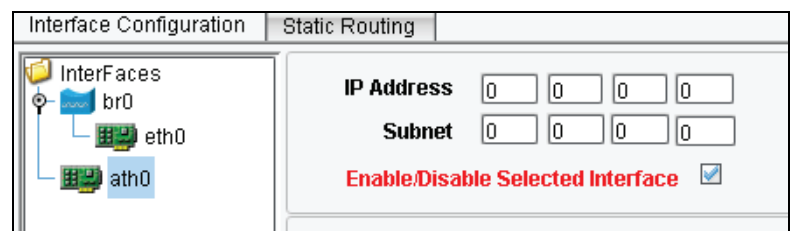
Now you need to select the bridge interface, select br0 and click in the **submit** button.



In the interfaces field you can see the eth0 interface underneath the br0 interface.

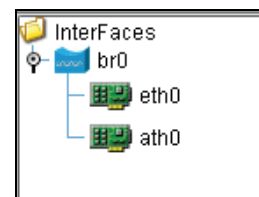


By default the wireless interface (ath0) is disabled, you need to enable the interface to be operational, select the ath0 interface and check the box **Enable/Disable Selected Interface**.



Insert the Interface ath0 into the bridge. Finally, you have eth0 and ath0 underneath the bridge which means the WaveKROM Backhaul is a bridge.

Click in the **Submit** button and then in **Save Node Configuration** to save the changes.



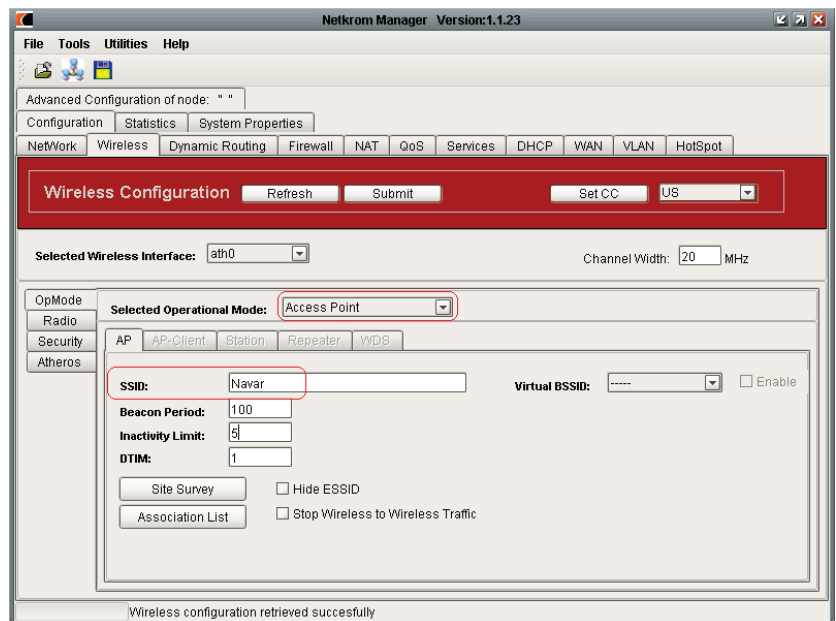
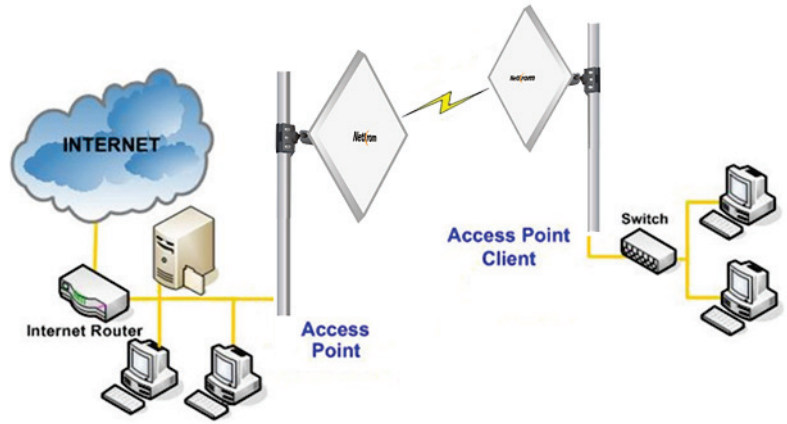
Wireless Point to Point Setup

The WaveKROM Backhaul is commonly used in Point-to-Point Applications.

You can implement a Point-to-Point connection by simply setting one radio in Access Point mode and setting the other radio in Client Mode or Station Mode.

Select **Access Point** mode from the selected operational mode drop down Menu. Insert a SSID string in the SSID box as it is shown and click the Submit button.

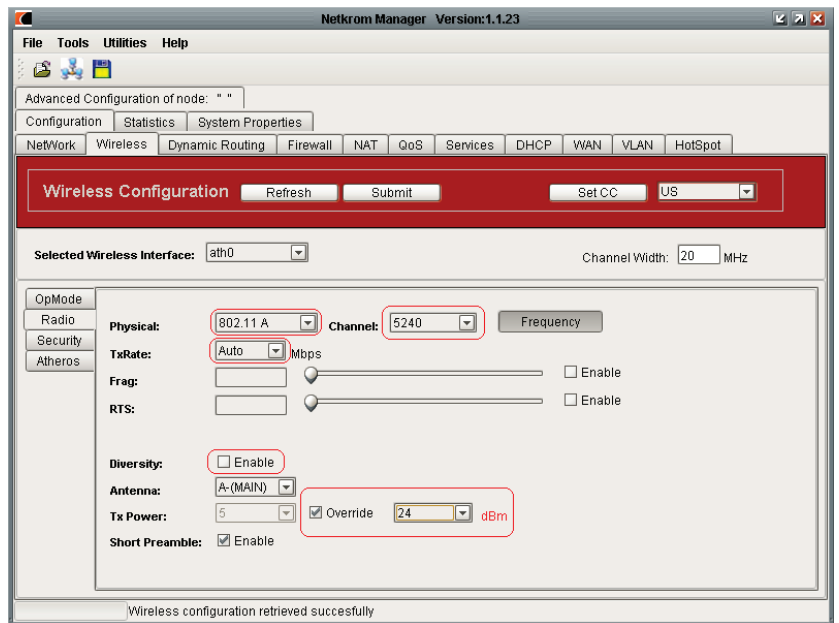
If you want to specify radio parameters go to **Radio** panel and there you can select the wi-fi standard you will use (*In case of the WaveKROM Backhaul, the standard you should select is 802.11a corresponding to the 5 GHz Frequency Band*). Additionally, you can assign the channel and transmission rate.



You can change the output tx power of your WaveKROM Backhaul, we recommend to select the **Override** option for long range wireless links, assign 24 dBm and disable the **Diversity** option as it is shown on the right side.

Note: For short links, it's not recommended to use high output power values; you should consider reducing the power until getting the best throughput and network stability.

In order to take effect the changes made in the configuration, click on **Submit** button and then in **save configuration**.

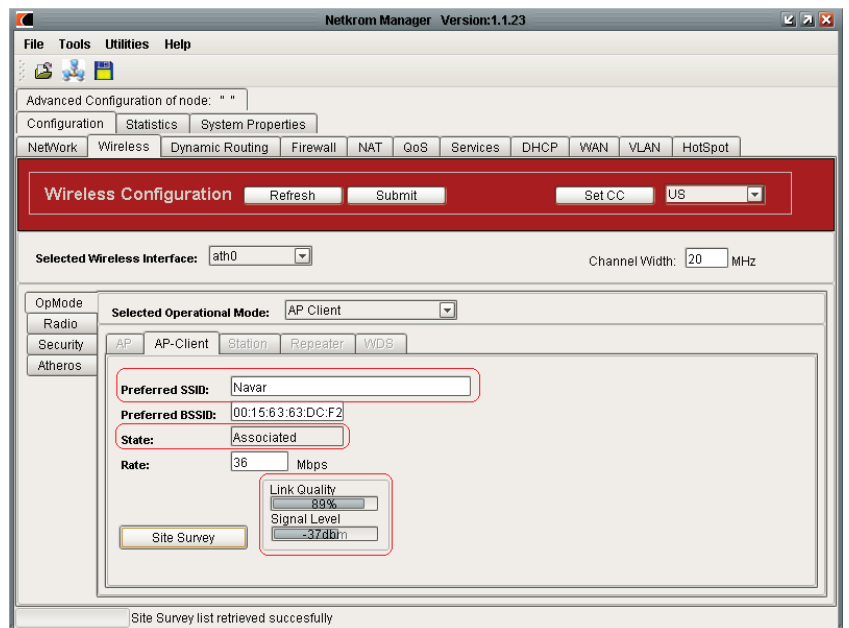
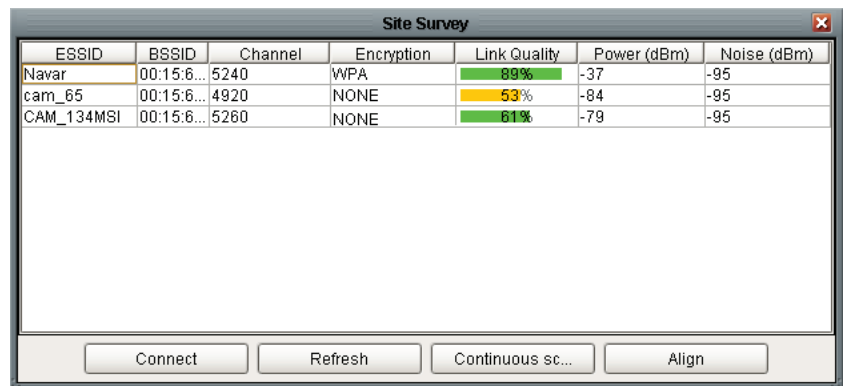
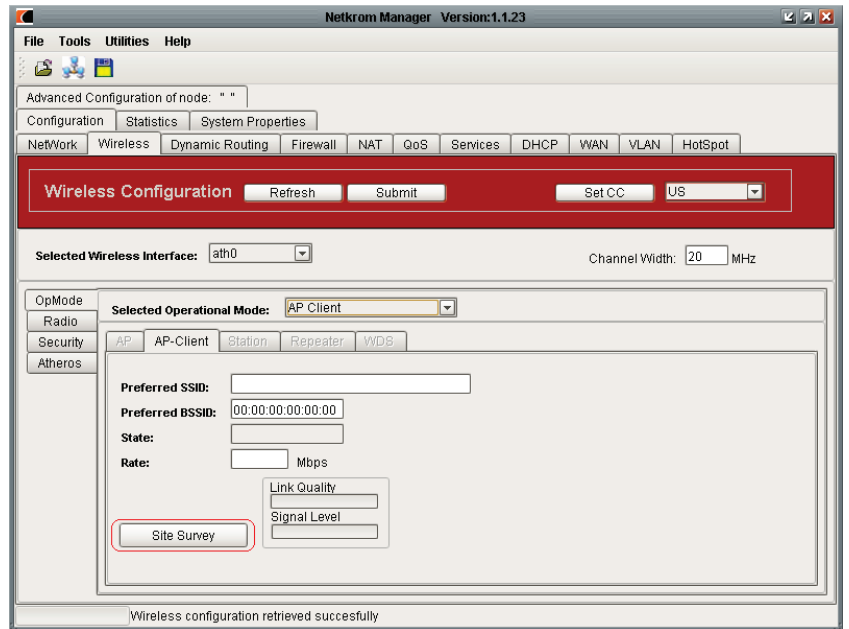


Configure the client device to operate in **AP Client Mode or Station Mode** and perform a Site Survey.

Select **AP Client** from the Selected Operational Mode Drop Down Menu.
Click the Site Survey button

Connect with the desired Access Point.
Select the desired ESSID from the Site Survey Pop-up Menu.
Click the **Connect** button

As soon as the devices get connected, the connection status bar informs you about the link quality and the Signal Level.

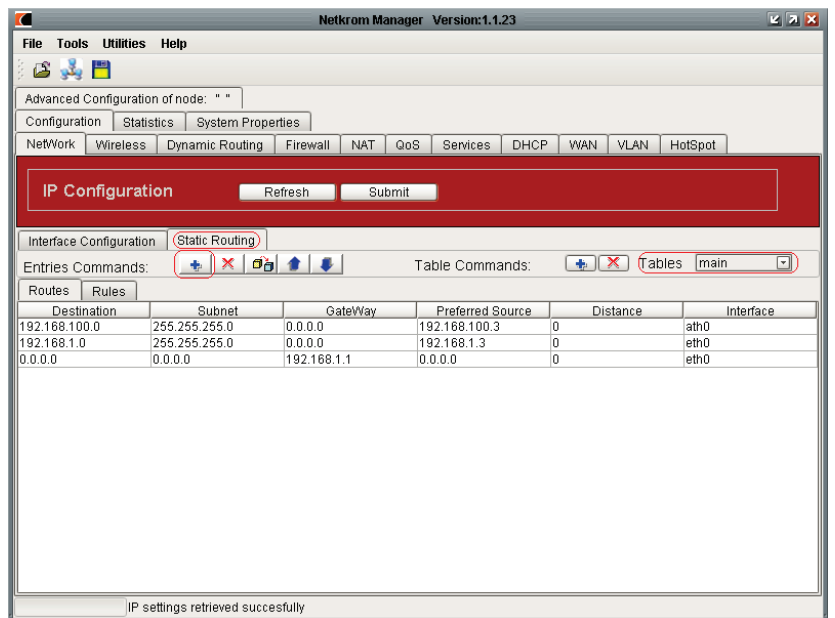


Static IP Routing (No Bridge Mode)

To configure **Static IP Routing**, select the **Static Routing** tab, located under **Network** tab. In the **Static Routing** tab you can select the **Routes** tab or the **Rules** tab.

If you want to add static routes just click on the add symbol as shown.

In the Destination box, type the destination network or destination host address, in the Subnet box, type the netmask for the destination net. (255.255.255.255 for a host destination and 0.0.0.0 for the default route), in the Default Gateway box, type the gateway address (if required), In the Interface drop down list, select the interface to which packets for this route will be sent. To accept your settings, click the Insert New Route dialog Submit button, then click the IP Configuration pane Submit button to complete the process.



Netkrom Manager Version:1.1.23

File Tools Utilities Help

Advanced Configuration of node: * *

Configuration Statistics System Properties

NetWork Wireless Dynamic Routing Firewall NAT QoS Services DHCP WAN VLAN HotSpot

IP Configuration Refresh Submit

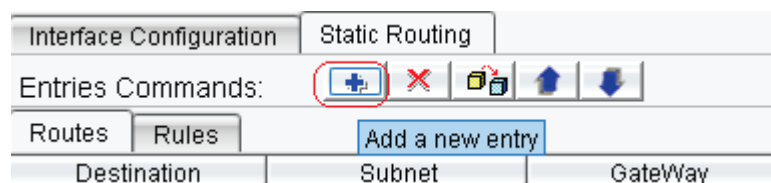
Interface Configuration (Static Routing)

Entries Commands: + X [Icons] Table Commands: + X Tables main

Routes Rules

| Destination | Subnet | GateWay | Preferred Source | Distance | Interface |
|---------------|---------------|-------------|------------------|----------|-----------|
| 192.168.100.0 | 255.255.255.0 | 0.0.0.0 | 192.168.100.3 | 0 | eth0 |
| 192.168.1.0 | 255.255.255.0 | 0.0.0.0 | 192.168.1.3 | 0 | eth0 |
| 0.0.0.0 | 0.0.0.0 | 192.168.1.1 | 0.0.0.0 | 0 | eth0 |

IP settings retrieved successfully

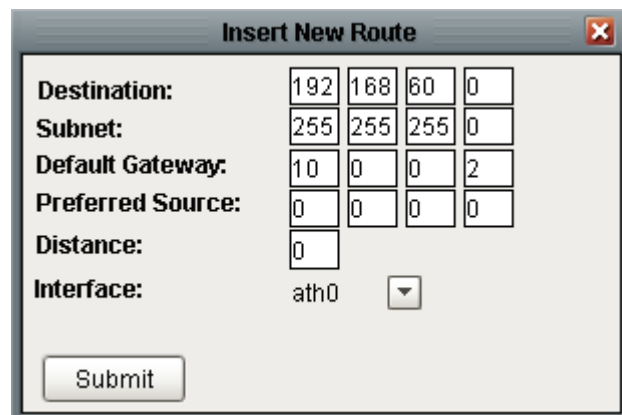


Interface Configuration Static Routing

Entries Commands: + X [Icons]

Routes Rules Add a new entry

Destination Subnet GateWay



Insert New Route

Destination: 192 168 60 0

Subnet: 255 255 255 0

Default Gateway: 10 0 0 2

Preferred Source: 0 0 0 0

Distance: 0

Interface: ath0

Submit

5. Advanced Configuration

1. – **Configuring VLANs:** Please go to page 43 of User Manual.
2. - **Advanced Routing Configuration:** Please go to page 46 of User Manual.
3. - **Advanced Wireless Configuration:** Please go to page 64 of User Manual.
4. - **Wireless Security Settings:** Please go to page 67 of User Manual.
5. - **Configuring Atheros Advanced Capabilities:** Please go to page 71 of User Manual.
6. - **Dynamic Routing:** Please go to page 78 of User Manual.
7. - **Firewall and NAT:** Please go to page 82 of User Manual.
8. - **DHCP Server, Client, Relay:** Please go to page 96 of User Manual.
9. - **Quality of Service:** Please go to page 108 of User Manual.
10. - **Hotspot:** Please go to page 130 of User Manual.

6. Congratulations

With these basics steps you can enjoy your wireless link without problems, please for more information about the capabilities and advance configuration of our product please see the user manual.

Contact Information

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Technical Support :

Worldwide and English Customers: support@netkrom.com

Latin American Customers: soporte@netkrom.com

The logo for Netkrom features the word "Netkrom" in a bold, italicized, black sans-serif font. A stylized orange swoosh or arc is positioned behind the "k" and "r", extending from the top of the "k" and curving under the "r".