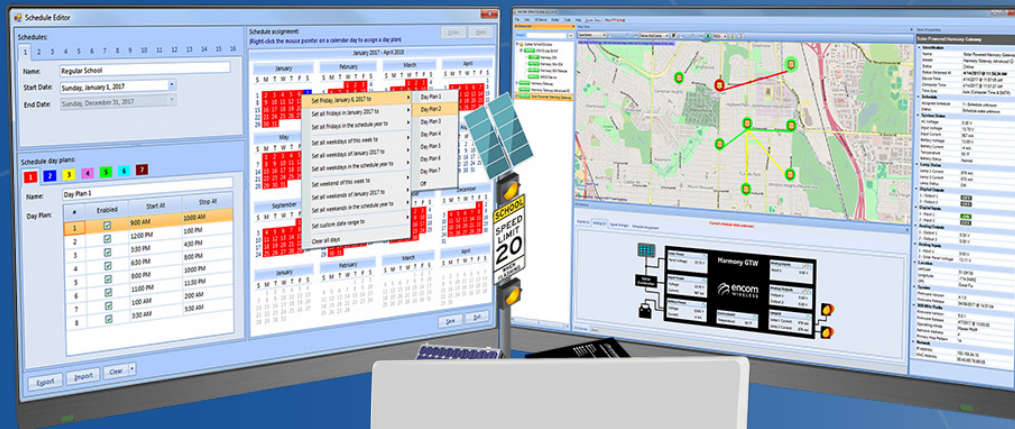


# BROADBAND QUICK START GUIDE



This document will help you with:

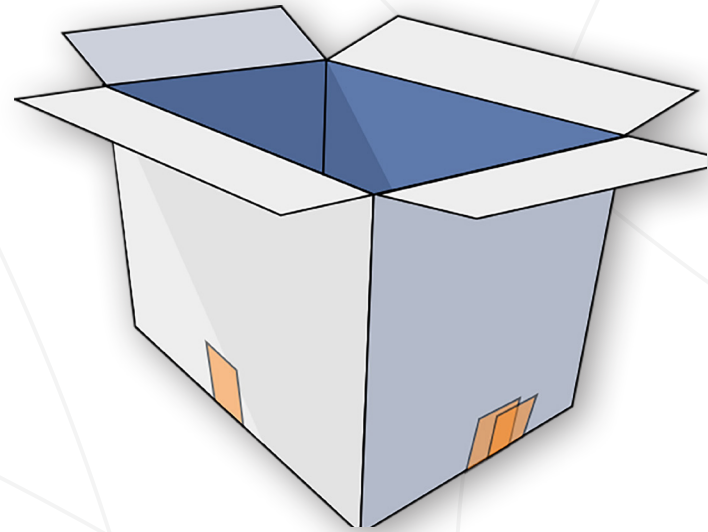
- Bench Testing
- Proper Equipment Mounting
- Configuring and verifying your equipment function using STRATOS Network Visualization and Management Software

## BEFORE YOU BEGIN...

Check and identify that the following equipment is included with your new Encom broadband radio:

- Power Over Ethernet Adapter (POE)
- 150 ft Ethernet Cable (straight through)
- AC Power Cord
- Standard 6-ft Ethernet Crossover Jumper Cable
- Mounting Bracket

**Always bench test your Encom radios in your office before field deployment.**



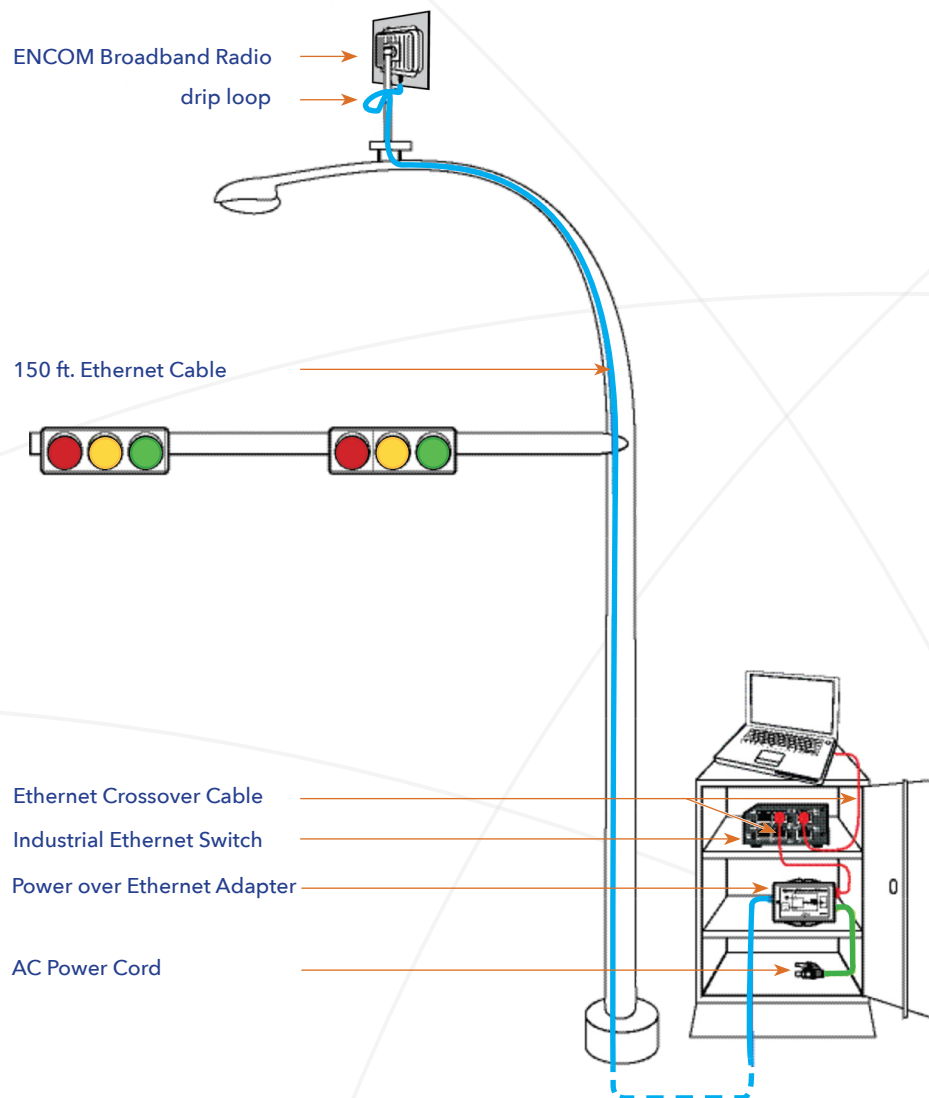
## IMPORTANT STEPS

- Before installing your radios, you should configure and test them in your office or lab environment. This will prevent confusion when installing the radios, and will make for a much smoother deployment.
- When configuring and testing the radios, use the actual hardware (antennas, cables, switches, etc.) that you will be installing in the field. That way, all parts of the system get tested, and you are less likely to find component failures in the field.
- Radios should always be tested in pairs. Three distinct pairings are possible:
  - ♦ A master radio with a remote that is connected to it.
  - ♦ A master radio with a repeater that is connected to it.
  - ♦ A repeater with a remote that is connected to it.
- In most cases, the master would be connected to a sector antenna, and the remotes would use an integrated panel antenna.
- A repeater would typically come with an integrated panel antenna, and its second radio card would be connected to either a panel antenna (for a backbone repeater), or a sector antenna.

### NOTE

Do not power up the radio if it is not connected to an antenna (two antennas for a repeater). Operating a radio without an antenna can permanently damage its transmitter.

## INTEGRATED BROADBAND RADIO MOUNTING



## IMPORTANT

**Always mount your ENCOM radio on the highest available point** to achieve optimal Line of Sight (L.O.S.) and signal strength.

**Always have a drip loop** for the cables that are connected to your ENCOM radio in both Integrated and Non-Integrated units.

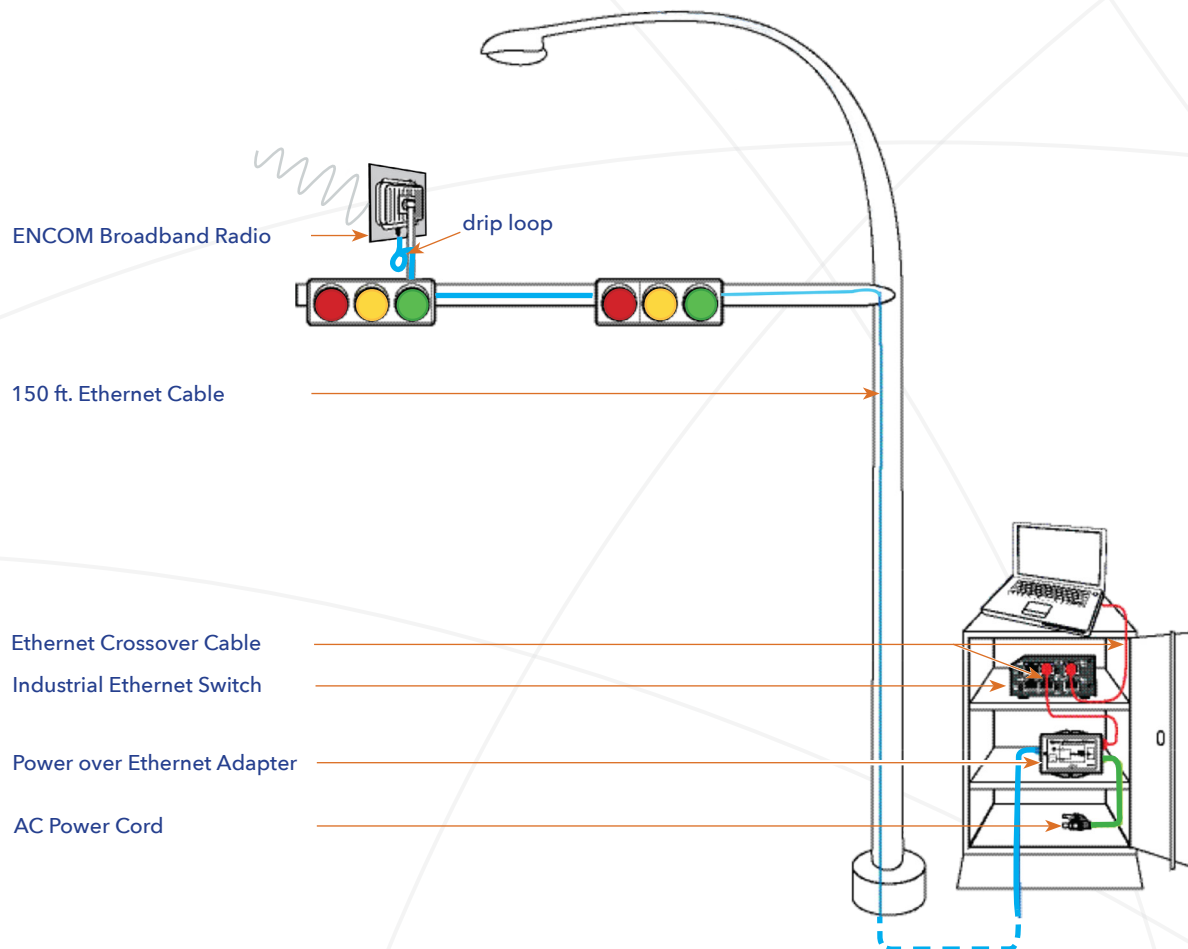
**Make sure that all antennas have the same polarization** (ie.vertical or horizontal). The polarization is indicated by a directional arrow on the back of each Integrated radio.

**Ensure all connections are free of debris and moisture.** Secure all connections and ensure proper weatherproofing steps are applied as outlined in the *Installation and Weatherproofing Guide*.

**Use a cross-over ethernet cable** when connecting a laptop to the switch. **Then use a straight through cable** from the Power over Ethernet (P.O.E.) out port to the radio.

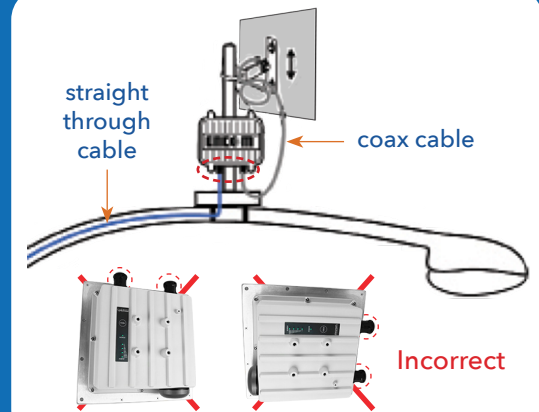
## ALTERNATE MOUNTING OPTION

AVOID LARGE OBSTRUCTIONS, such as trees and large buildings, to achieve optimal line of sight and signal strength.

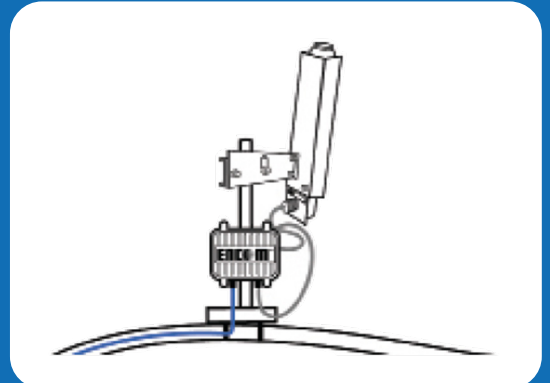


## ANTENNA INSTALLATION

Antennas used depend on the ENCOM Broadband Radio purchased.



## NON-INTEGRATED BROADBAND RADIO WITH PANEL ANTENNA



## NON-INTEGRATED BROADBAND RADIO WITH SECTOR ANTENNA

### STEP 1:

Install the STRATOS software by creating a user login and downloading the software from [www.encomwireless.com](http://www.encomwireless.com). Once the STRATOS software is installed, double click the ENCOM STRATOS desktop icon to launch the software.



### STEP 2:

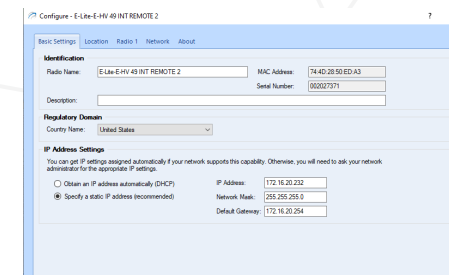
Plug in the 150-ft Ethernet cable into the broadband radio and the other end into the PoE port labeled Splitter or OUT. Plug in the AC power cord to the PoE and into an AC power supply. The standard 6-ft crossover Ethernet cable is to be plugged into the PoE port labeled Switch Hub or IN and the other end into the Ethernet port of the desktop/laptop computer.

### STEP 3:

Change the IP address of the radio to match the subnet you are currently on by using the 'Assign Static IP Address' command on the Radio menu. Press F1 for more details on this command.

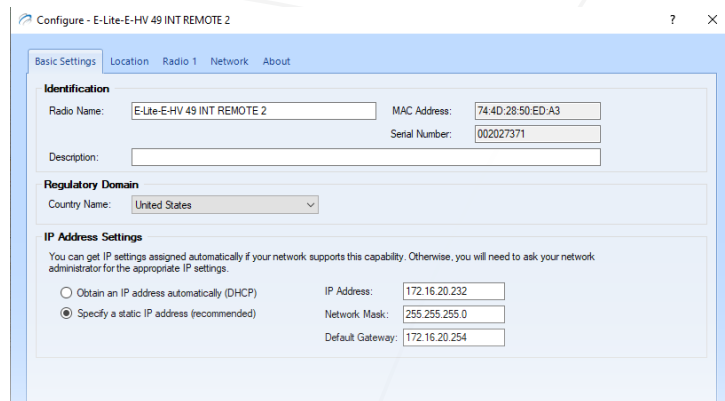
### STEP 4:

The STRATOS Radio List will display the radio. A radio that is online and can be reached by STRATOS is shown with a green icon. A radio that is offline and unreachable by STRATOS is displayed with a red icon. A radio that is currently on-line but needs some type of attention is shown with a yellow icon. (For more information on changing the subnet of a radio to the subnet of your network, see the ENCOM STRATOS Software Manual, OR Press F1 to access the help menu).



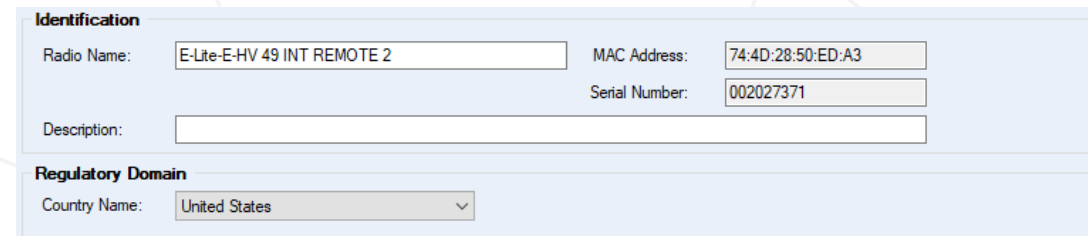
### STEP 5:

To configure the connected radio double click on the radio name from the Radio List. The STRATOS software will start its login process to connect to the desired radio. Once the STRATOS software has logged in to the radio you will see the Configure window for that unit.



### STEP 6:

From the Basic Settings tab enter the Radio Name and Description for the radio - for example, the location of the radio and any special notes. The radio name will appear on the Radio List once the configuration has been completed. Under the Regulatory Domain select the Country Name in which the radio is intended to operate.



Press F1 from any screen in STRATOS to access the HELP database.



# CONFIGURING YOUR **BROADBAND** RADIO WITH STRATOS™



## STEP 7:

Out of the box, your Encom radio comes preconfigured with an IP address of 192.168.0.1. We recommend using **ONLY** static IP addressing to avoid confusion and device miscommunication issues. Ensure that you obtain the correct IP Address and network information from your I.T. department.

### IP Address Settings

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you will need to ask your network administrator for the appropriate IP settings.

- ☐ Obtain an IP address automatically (DHCP)
- ☒ Specify a static IP address (recommended)

IP Address:

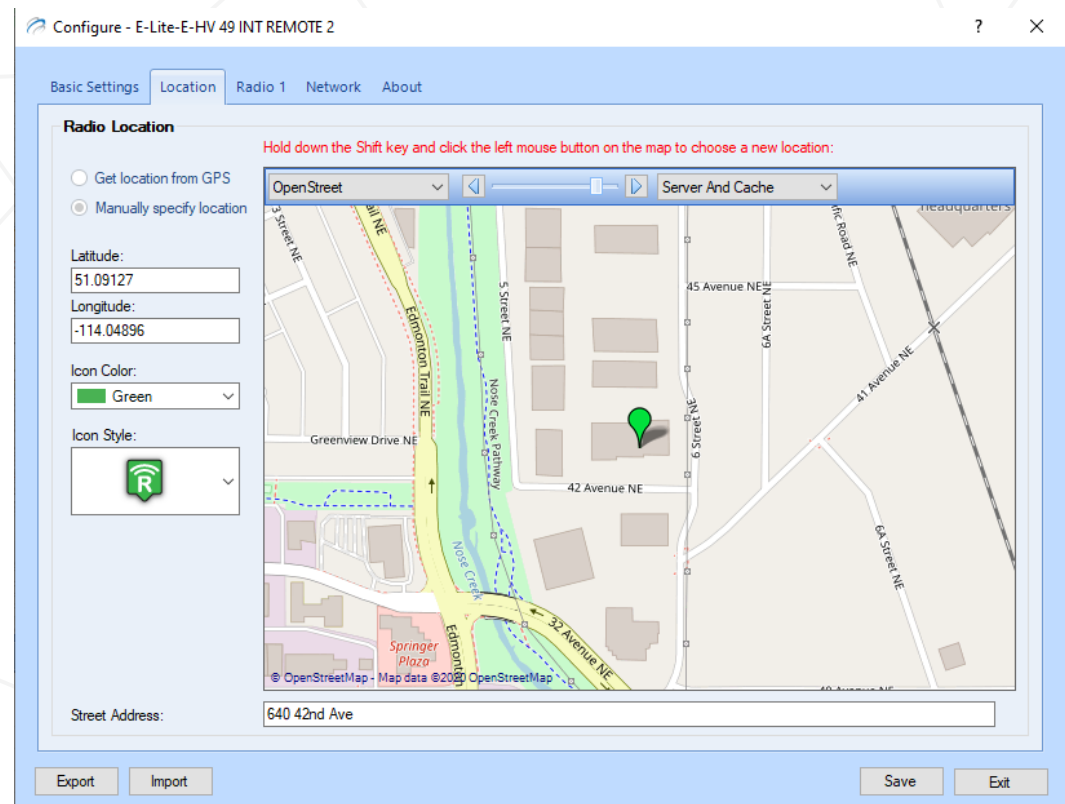
Network Mask:

Default Gateway:

## STEP 8:

Go to the Location tab to select map icon color and style. Select the location of the icon on the map by holding down the Shift key and clicking the desired location on the map.

Press F1 from any screen in STRATOS to access the HELP database.



## STEP 9:

Go to the Radio 1 tab to select the wireless settings for the radio.

The following fields need to be configured:

### RADIO NETWORK SETUP

**NOTE:** All the settings in the Radio Network Setup field must match in each radio in the network for a wireless link to be established.

#### Radio Network Setup

Network Type:	Point-to-Multipoint	N-Only	eMax Protocol:	eMax
Network SSID:	ENCOMTEST	<input checked="" type="checkbox"/> Hide SSID		
Radio Mode:	Master	<input type="checkbox"/> Using Repeater		
Channel Mode:	40 MHz			

### NETWORK TYPE

This field indicates the type of radio you are activating and cannot be changed.

### NETWORK SSID

This is the user-defined network name that all the broadband radios in a network must use in order to successfully communicate. Change the default network name to one that is unique for your network. Clicking the Hide SSID checkbox will keep your network name hidden from outside users.

### RADIO MODE

Each system consists of one master and one or more remotes/repeaters. The Radio Mode allows the user to choose whether the radio will be programmed as a Master, Repeater or Remote. If a repeater is present in the network, place a check mark in the Using Repeater box. Press F1 to get a more detailed description of the Radio Mode option.

**NOTE:** The Using Repeater box will be disabled while the eMax Protocol is enabled.

### CHANNEL MODE

This option lets the user determine the transmission channel width for radios in the network. A smaller channel size results in less bandwidth but longer distance for communication. For Line of Site (LOS) links, use 20MHz or 40MHz mode for maximum bandwidth. For near line of site (NLOS) use the 5MHz or 10MHz channel mode for maximum distance.

### ENABLE eMAX PROTOCOL

Click in the box to enable the proprietary eMax protocol. This ensures the highest possible throughput available on the network. This is recommended for Point to Multipoint and video applications.

**NOTE:** The eMax Protocol overrides any selection applied to the Using Repeater box.

### USING REPEATER

While in N-Mode operation, this option is grayed out. This option can only be selected in A-Mode operation. See page 6 on Broadband Radio configuration for Using Repeater usage (Or press F1 for more information).

### RADIO PARAMETER SETUP

The Radio Parameter Setup displays information on the Frequency Band, the Channel Frequency, the Wireless Link Rate and the Output Power the radio is operating in.

#### Radio Parameter Setup

Frequency Band:	4.9 GHz Public Safety Band	Wireless Link Rate:	Adaptive	
Channel:	Auto-Frequency	Output Power:	Maximum	Update Radio Power

### FREQUENCY BAND

Shows the frequency band that the radio will operate in. This field depends on the type of radio you are configuring and cannot be changed.

### CHANNEL

A default channel frequency will be set for your radio. In a system that has multiple wireless networks close to each other, it is recommended that you assign a fixed channel frequency that is different to each master to help prevent wireless interference between networks.

### WIRELESS LINK RATE

The Wireless Link Rate is set to Adaptive by default. This setting should be changed ONLY by advanced users or in situations where the system requires a reduced link rate.

### OUTPUT POWER

By default, Output Power is set to Maximum but can be adjusted if TX signal strength is too strong.

Click SAVE to save and complete the configuration. Changes are automatically sent to connected radios resulting in icons turning **red** (offline) momentarily, then back to **green** (online).



# TESTING YOUR COMMUNICATION LINK WITH STRATOS™



The following STRATOS test tools are available to monitor the wireless link health and stability:

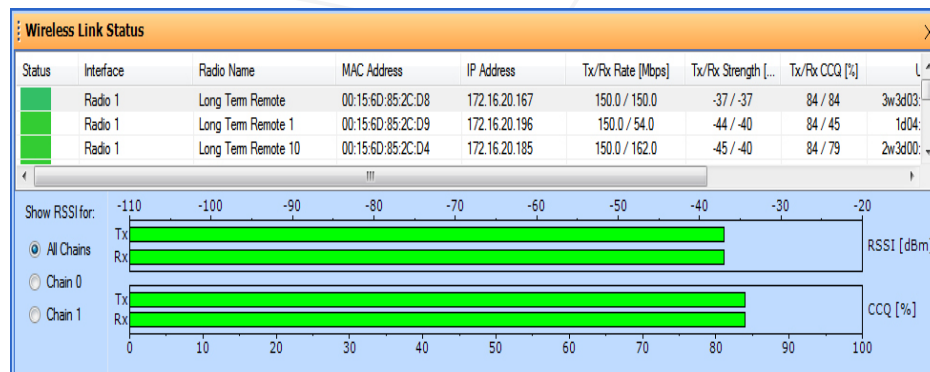
1. Wireless Link Status
2. Bandwidth Test
3. Network Traffic
4. Ping Test
5. Spectrum Scan

In order to use any of these tools, program one radio as the Master and one as the Remote. This is the most basic wireless link known as a Point-to-Point link. Establish a Point-to-Point link and then single click on either the master or remote radio in the Radio List to automatically start using the STRATOS test tools.

## Wireless Link Status

The Wireless Link Status tool shows the radios that are connected to the selected radio along with a graphical representation of the Received Signal Strength Indicator (RSSI) and Client Connection Quality (CCQ %) between two radios in the wireless link.

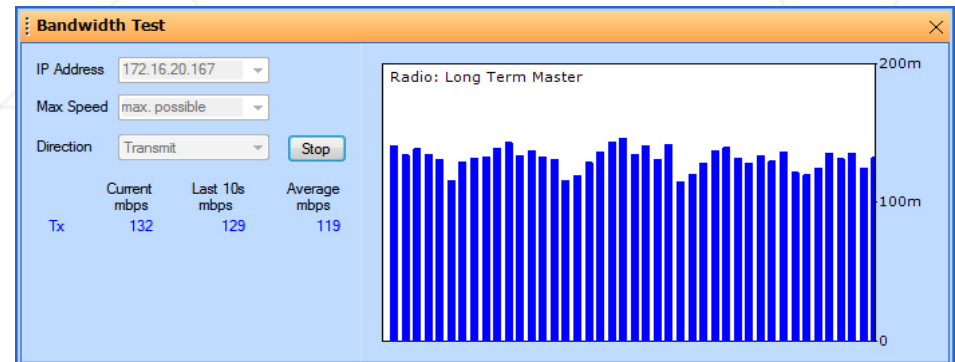
Manually aim the antennas such that the highest possible connection quality is achieved in the wireless link. For 802.11n radios, an RSSI of -35dBm to -60dBm is recommended. An RSSI value closer to -40dBm is recommended to obtain optimal bandwidth. For all other broadband radios an RSSI of -40dBm to -70dBm is recommended.



## Bandwidth Test

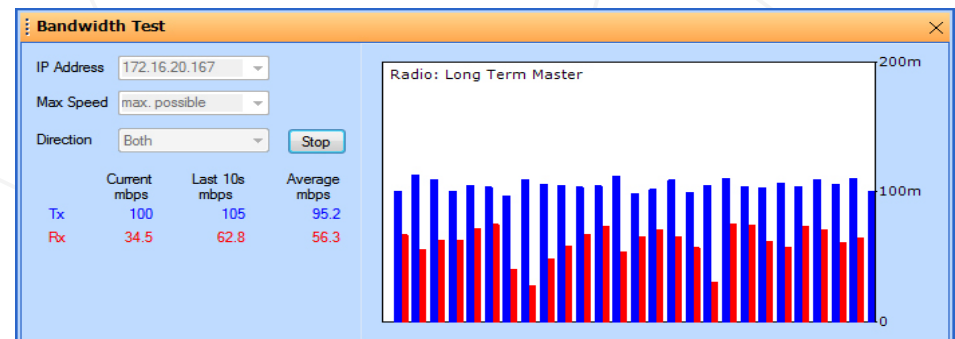
This test determines throughput for a selected wireless link in the network. Run the test in one direction at a time. It is important to estimate the available throughput for the wireless link before interfacing with equipment that utilizes the available bandwidth. To maximize the bandwidth of a network, enable eMax and set the Channel Mode to the highest available width (ie. 80 MHz) without sacrificing connection quality.

**IMPORTANT** After installation of a network, an onsite bandwidth test must be performed from the Master radio to establish and ensure wireless link integrity in real time given the geographic elements present onsite.



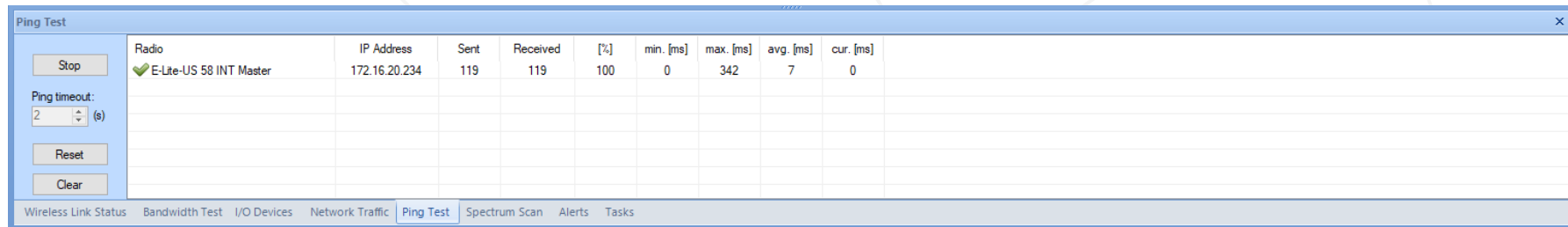
## Network Traffic

The Network Traffic tool is used to see what data is travelling on the ethernet and wireless interfaces of the selected radio. The sending and receiving transmission information is displayed, allowing a user to see the flow of data once external equipment is connected to the wireless network (ie. controllers, PTZ cameras).



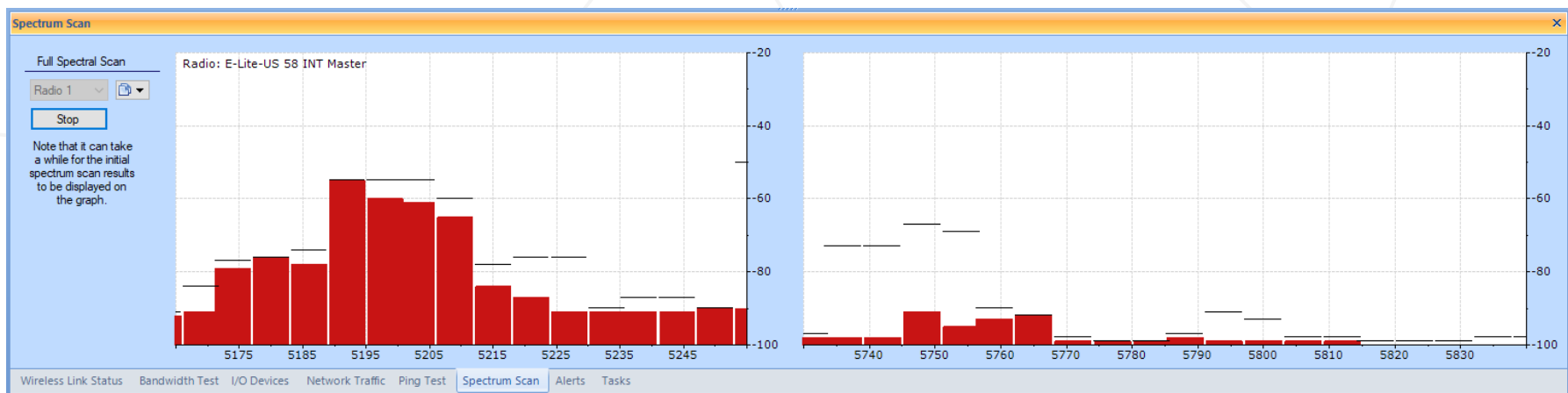
## Ping Test

The Ping Test panel displays the results of an on-going broadband radio ping test. A ping test consists of periodically sending ICMP message (pings) to a group of radios and recording the latency of the responses. The latency is the interval between the time at which the ICMP message is sent and the time at which the response is received.



## Spectrum Scan

The Spectrum Scan panel allows you to visualize the external wireless traffic that exists in a broadband radio's frequency band. You can use this information to decide the best frequency to assign to the radio. In most situations, you want to use a frequency that has the least amount of traffic, as interference from external sources will adversely affect a wireless connection's effective bandwidth. Set the Master radio to this selected channel. There is no need to set this at remote radios because they will follow the Master automatically: (from the following example, select channel 5820 or 5830).



**THANK YOU!**



Please contact us anytime if you have any questions or concerns regarding your Encom equipment.

Toll Free: 1.855.730.1122

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