S&C SpeedNet™ Radio Quick Configuration Guide

Introduction

This guide provides instructions for configuring up to five new SpeedNet Radios in a lab or office setting, establishing a mesh network over-the-air and exchanging Internet Protocol (IP) traffic. For complete installation, setup, and diagnostic instructions for SpeedNet Radios, refer to S&C Instruction Sheets 1072-510, 1072-530, and 1072-550, respectively.

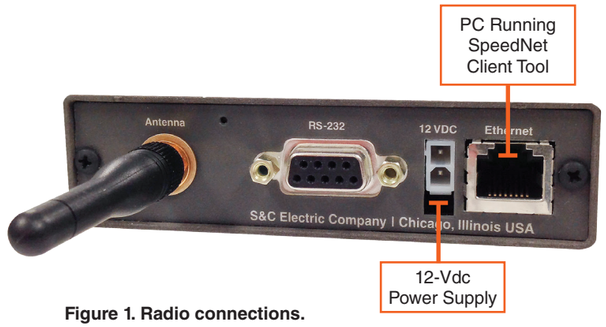

Figure 1. Radio connections.

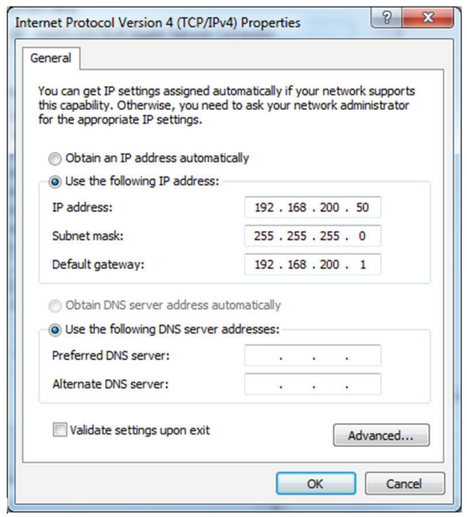

Figure 2. Configuring PC Ethernet port.

Required Tools and Supplies

You'll need a Windows® PC with SpeedNet™ Client Tool software installed. Administrator privileges to the PC will likely be needed to change Ethernet port settings. No hand tools are required. Hand-tightening of connectors is sufficient.

Connections to the Radio

Follow these steps to connect your SpeedNet Radio:

Step 1. Connect an indoor antenna to a 30-dB in-line attenuator with SMA connectors. Then connect the attenuator to the antenna port of the radio. The other option is to set Transmit Power to 10 dBm from SpeedNet Client Tool Interfaces *Wireless* screen, as show in Figure 5.

Step 2. Connect an Ethernet cable from the Ethernet port of the PC to the Ethernet port of the radio.

Step 3. Connect a 12-Vdc power supply to the 12-Vdc input of the radio. See Figure 1. Then, energize the power supply.

PC Configuration

Configure the Ethernet port of the PC to match the default radio configuration, as shown in Figure 2. The default radio IP address is 192.168.200.1 with subnet mask 255.255.255.0. The recommended PC IP address is 192.168.200.50 with subnet mask 255.255.255.0 and default gateway 192.168.200.1. Changing Ethernet port settings on the PC generally requires administrator privileges. The PC's wireless (Wi-Fi) interface needs to be disabled in order to direct all traffic out of the Ethernet interface.

Radio IP Address Plan

Each radio must have the appropriate IP addresses assigned to it, as shown in Table 1.

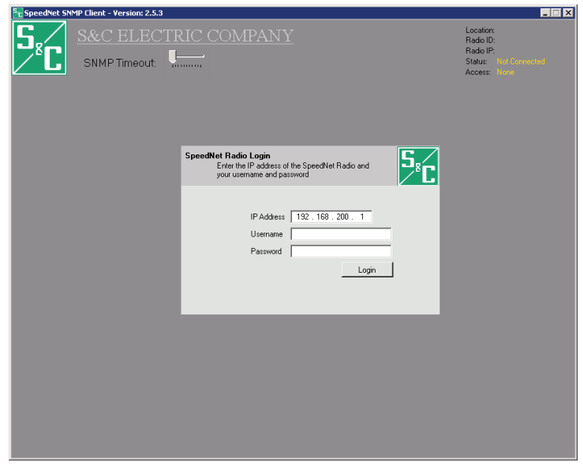

Figure 3. SpeedNet Client Tool *Login* screen.

Logging In Using Client Tool

Follow these steps to log in to the Client Tool:

Step 1. Launch the SpeedNet Client Tool. The SpeedNet Radio *Login* screen will appear, as shown in Figure 3.

Step 2. Enter the default as-shipped radio IP Address 192.168.200.1 and the default username and password. Contact S&C to obtain these credentials.

Step 3. Click the **Login** button. The SpeedNet Client Tool *Welcome* screen will appear, as shown in Figure 4.

After the radios have been configured, you can log into a particular radio by clicking the **Main** tab, selecting the desired radio, and then clicking the **Connect To . . .** button on the *Welcome* screen.

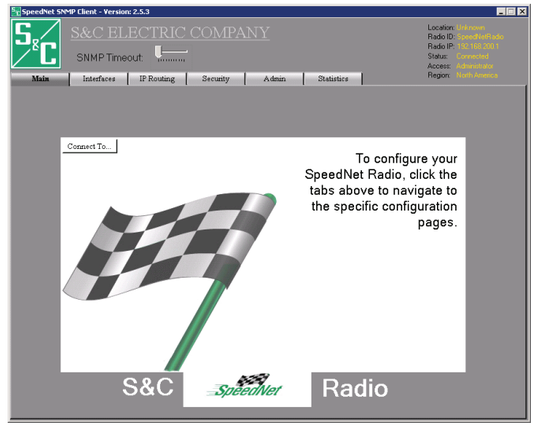

Figure 4. SpeedNet Client Tool *Welcome* screen.

Table 1. Quick Configuration IP Addressing Scheme

Radio Number	Wireless IP Address	Wireless IP Mask	Ethernet (Wired) IP Address	Ethernet IP Mask	Corresponding PC Ethernet port IP Address
1	192.168.250.1	255.255.255.0	192.168.1.1	255.255.255.0	192.168.1.50
2	192.168.250.2	255.255.255.0	192.168.2.1	255.255.255.0	192.168.2.50
3	192.168.250.3	255.255.255.0	192.168.3.1	255.255.255.0	192.168.3.50
4	192.168.250.4	255.255.255.0	192.168.4.1	255.255.255.0	192.168.4.50
5	192.168.250.5	255.255.255.0	192.168.5.1	255.255.255.0	192.168.5.50

Configure Wireless IP Address

Follow these steps to configure the wireless IP address:

Step 1. Determine which of the radios you are programming, starting at Radio 1.

Step 2. Determine the corresponding Wireless IP Address and Wireless IP Mask from Table 1. For example, Radio 1 has Wireless IP Address 192.168.250.1 and Wireless IP Mask 255.255.255.0.

Step 3. Go to the SpeedNet Client Tool Interfaces Wireless screen, as shown in Figure 5.

Step 4. Enter the IP Address and Subnet Mask, and then click on the **Apply** button. You may need to log into the radio again after this step. All Wireless IP addresses assigned to radios on the same mesh must be in the same subnet.

Configure Ethernet IP Address

Follow these steps to configure the Ethernet IP address:

Step 1. Determine which of the radios you are programming, starting at Radio 1.

Step 2. Determine the corresponding Ethernet IP Address and Ethernet IP Mask from Table 1. For example, Radio 1 has Ethernet IP Address 192.168.1.1 and Ethernet IP Mask 255.255.255.0.

Step 3. Go to the SpeedNet Client Tool Interfaces Ethernet screen, as shown in Figure 6.

Step 4. Enter the IP Address and Subnet Mask, and then click on the **Apply** button. All Ethernet IP addresses assigned to radios on the same mesh must be on different subnets.

Once the Ethernet IP address of a radio has been changed, the PC can no longer communicate directly with the radio until the Ethernet port of the PC is changed accordingly. For example, for Radio 1, the Ethernet port is assigned the IP address 192.168.1.1 with mask 255.255.255.0. The Ethernet port of the PC must be assigned the IP address 192.168.1.50 with mask 255.255.255.0 and default gateway 192.168.1.1 to communicate through a wired Ethernet connection directly to Radio 1.

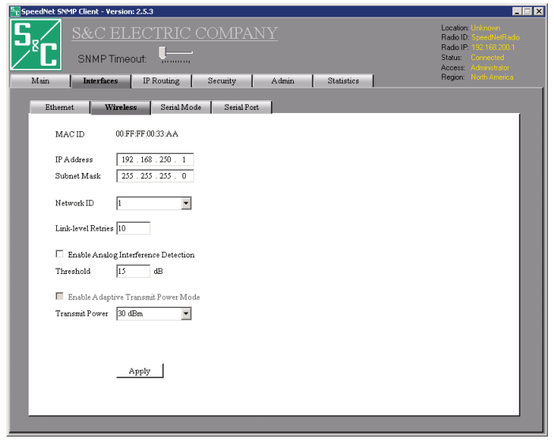

Figure 5. SpeedNet Client Tool Interfaces *Wireless* screen.

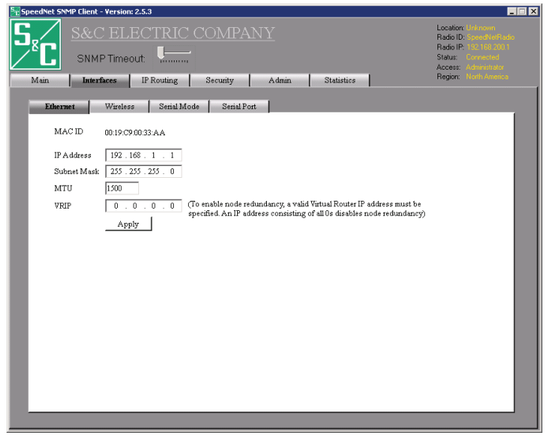

Figure 6. SpeedNet Client Tool Interfaces *Ethernet* screen.

Configure Remaining Radios

Configure the Wireless IP and Ethernet IP addresses for the Radios 2 through 5 following the same procedure. The radios should remain powered up after configuration to facilitate testing.

Prepare for Testing

Follow these steps to prepare the radio for testing:

Step 1. Connect the PC via Ethernet to Radio 5, if it is not already connected.

Step 2. Change the Ethernet port of the PC to the same subnet as the Ethernet port of Radio 5. Specifically, the PC should have its Ethernet port IP address set to 192.168.5.50 with mask 255.255.255.0, and Gateway 192.168.5.1. The PC's wireless (Wi-Fi) interface needs to be disabled in order to direct all traffic out of the Ethernet interface.

Ping Radios

Follow these steps to ping the radios:

Step 1. Bring up the Windows command prompt. See Figure 7.

Step 2. Use the ping command to ping Radio 5 Ethernet port IP address 192.168.5.1.

Step 3 Ping Radio 5 Wireless address 192.168.250.5.

Step 4. Ping the other radios at their respective Ethernet and Wireless addresses.

All pings should succeed. The round-trip time may be greater for the first ping than for subsequent pings, as routes are created then reused for subsequent pings.

Check AODV Neighbor List

Follow these step to check the AODV Neighbor list:

Step 1. Log in to Radio 5 using the SpeedNet Client Tool.

Step 2. Go to the SpeedNet Client Tool Statistics *AODV* screen, as shown in Figure 8.

Radios 1 through 4 should be listed as neighbors, identified by their respective Wireless IP addresses. You can log into Radio 5 and the other radios by using their respective Wireless IP addresses.

The five SpeedNet Radios have created a mesh network. In this configuration, a communication path exists from each radio to every other radio, sometimes through intermediate routing nodes, if needed.

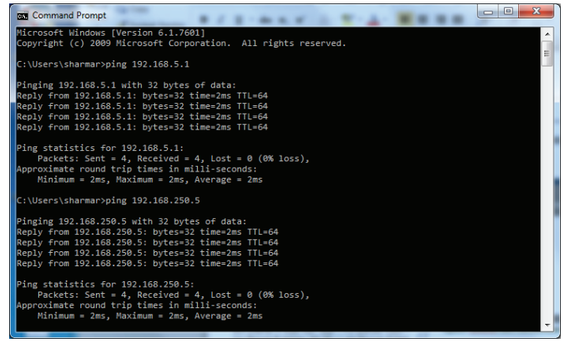

Figure 7. Ping Test.

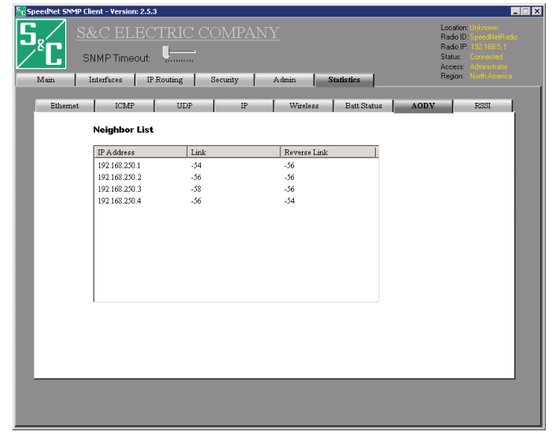

Figure 8. SpeedNet Client Tool Statistics *AODV* screen.