Point to Multi-point Link: Bridge Mode

airPoint Nexus PRO TOTAL (sB 3212)
&
airClient Nexus PRO TOTAL (sB 3412)

Configuration Guide

Version 1.0

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Introduction

This Instruction Manual aims to help the basic user in configuring and establishing a wireless link in Bridge mode using the Nexus access point - airPoint Nexus PRO™ TOTAL (hereafter termed aPNPT) and the client device - airClient Nexus PRO™ TOTAL (hereafter termed aCNPT). It also contains information on editing some of the radio performance parameter settings to optimize the link.

Installation

The following are the required network components:

Component	No of units
aPNPT- (sB3212) with built-in 12 dBi internal antenna	1
aCNPT- (sB3412) with built-in 17 dBi internal antenna	1
PoE Injector	2
Power Adaptor	2
External Antennas (optional)	2
Laptop / Computer	2

The figure below illustrates how to connect the network components. For more information on connections, please refer to the Quick Installation Guide.

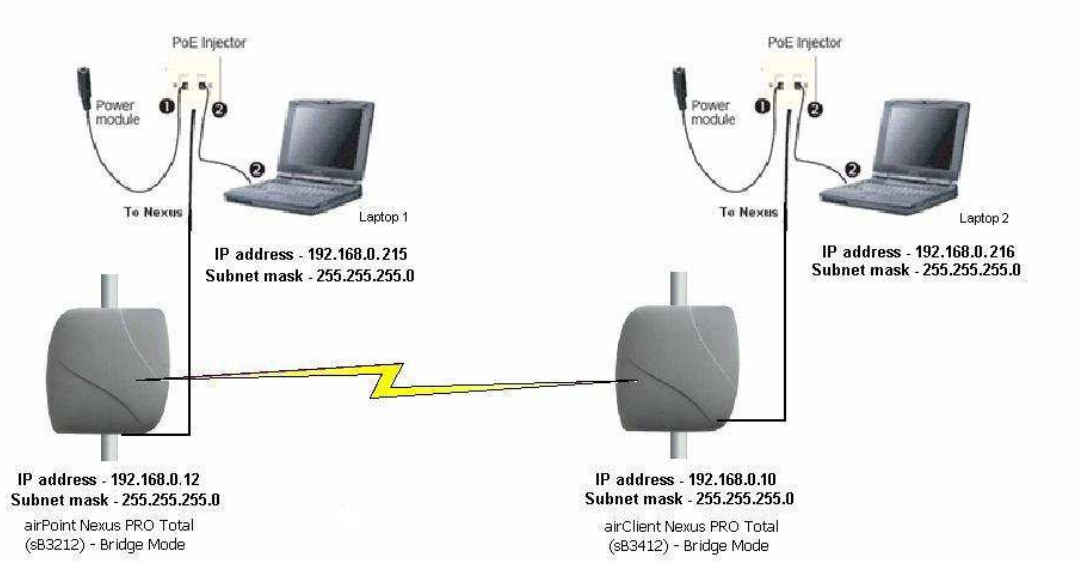

Figure 1 - aPNPT (sB3212) & aCNPT (sB3412) Installation

Configuration – airPoint Nexus PRO TOTAL (sB3212) in Bridge Mode

Default IP address and Login Information: aPNPT (sB3212)

Default IP address (Sb3212)	192.168.0.212
Login URL	http://192.168.0.212
User Name	Administrator
Password	smartBridges

To log in to the aPNPT follow the steps below:

1. Launch the web browser (e.g. Internet Explorer) and use the default IP address to log in with user name and password as given above.

Figure 2a - GUI Login

Figure 2b - Login screen

2. Upon logging in, you will see the agreement page. Read and click **OK** to accept the agreement.
3. You can now navigate the menus of aPNPT.

Figure 3 - Navigation Menu of aPNPT in Bridge mode

Note:

- To log in to the aPNPT, the connected laptop/computer must be in same subnet.
- The default operation mode is Bridge Mode.

IP Address Assignment for aPNPT in Bridge Mode

Units	IP Address
aPNPT – 1st Unit	192.168.0.12 / 255.255.255.0
Laptop / Computer **1**	192.168.0.215/255.255.255.0

A) Ethernet Interface configuration

To change the Ethernet IP address, follow the steps below:

1. Go to **Home** drop down menu and select **Summary Info**.
2. In the **Bridge IP Configuration** tables enter the assigned IP address as indicated below:
    - IP address -192.168.0.12
    - IP mask -255.255.255.0
    - Gateway -0.0.0.0 (Gateway of the main/internet router)
    - DHCP – disable
3. Click **Apply Changes**.

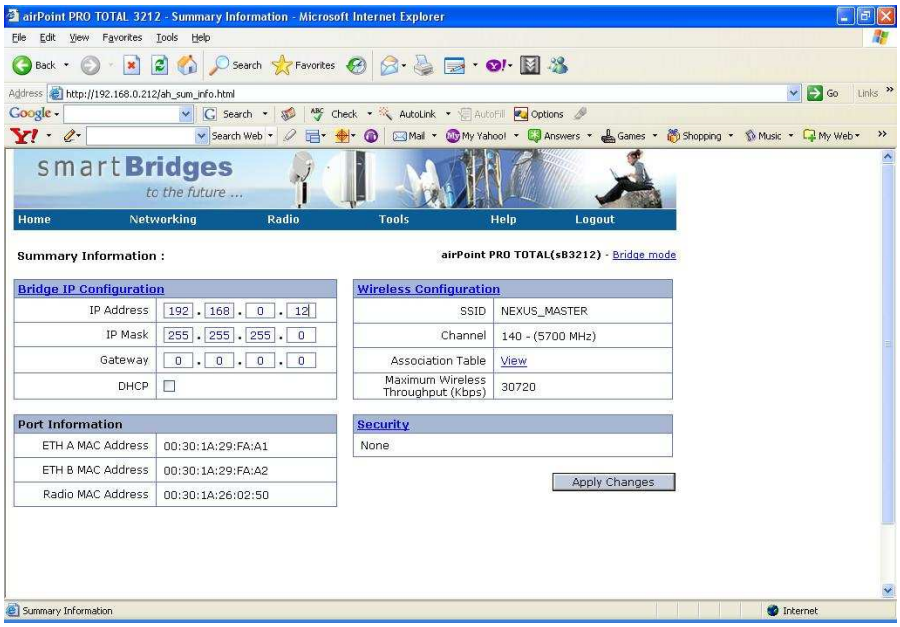

Figure 4 - Summary Page for Bridge IP Configuration

B) Wireless Interface configuration

To change the wireless settings follow the steps below:

1. Go the menu bar and select Radio **– Main airPoint Nexus Bridge.**
2. Click on **Wireless Settings** to edit.
3. Enter SSID – **NEXUS_MASTER.**
4. Choose a radio domain from the drop down menu - **ETSI or FCC.**
5. Choose the Radio Operating Mode: **802.11 a/b/g.**
6. Choose a radio channel to associate with the client- for example **Ch140 (5700 MHz).**
7. Antenna selection – **Internal** (if you are using an external antenna, select “External”).
8. Choose the data rate: **54 Mbps.**
9. Auto rate fallback – **Enable** (recommended).
10. Select the transmit power of the radio from the ‘Dial-a-Power’ drop down menu: - **18 dBm.**
11. Antenna gain - **12dBi** for internal (for information only).
12. RF cable loss based on the cable specifications: -**0** (for information only).
13. Client to Client communication – **Disable** (please do not select if you want to disable Client to Client communication).
14. Click on ‘**Apply Changes**’.

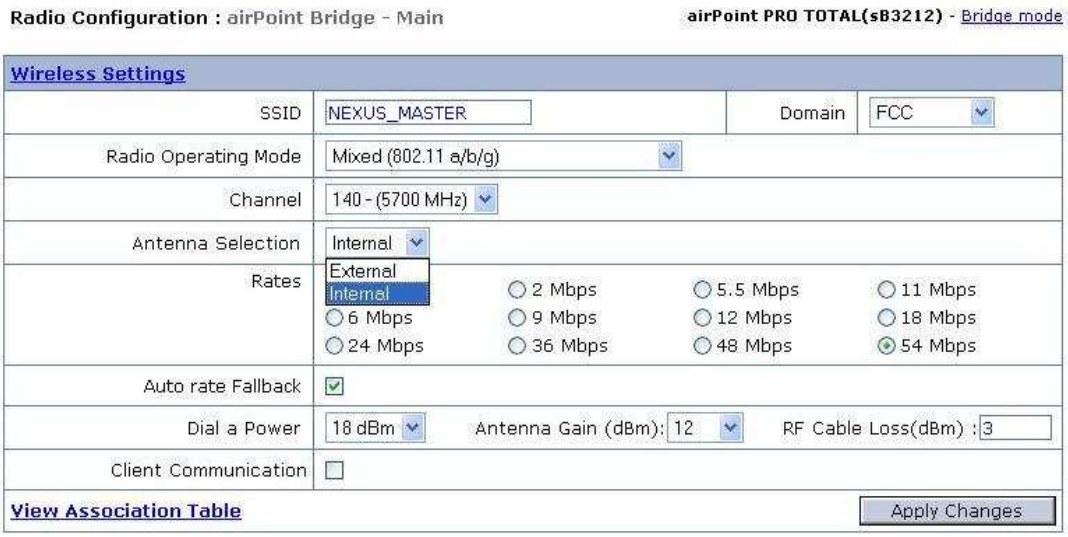

Figure 5 - Wireless Settings

C) WDS Entry Configuration

To enter information in the WDS table follow the steps below:

1. Go to Radio ---> Security.
2. Click on **Security.**
3. Select None from the drop down menu in a Security mode.
4. Key in the Radio Mac Address of the airClients which are in a Bridge Mode in WDS Table**.**
5. Click **Add to Table** Tab.
6. Apply changes.

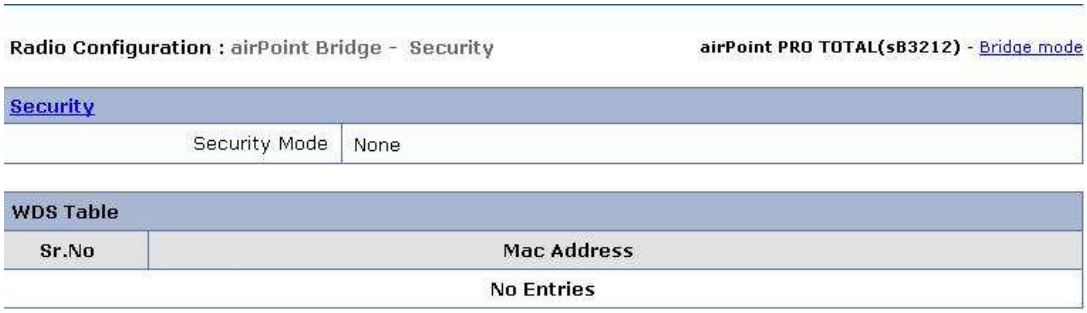

Figure 6 - Security Mode and Bridge Selection

Figure 7 - WDS MAC Address under Radio: Security

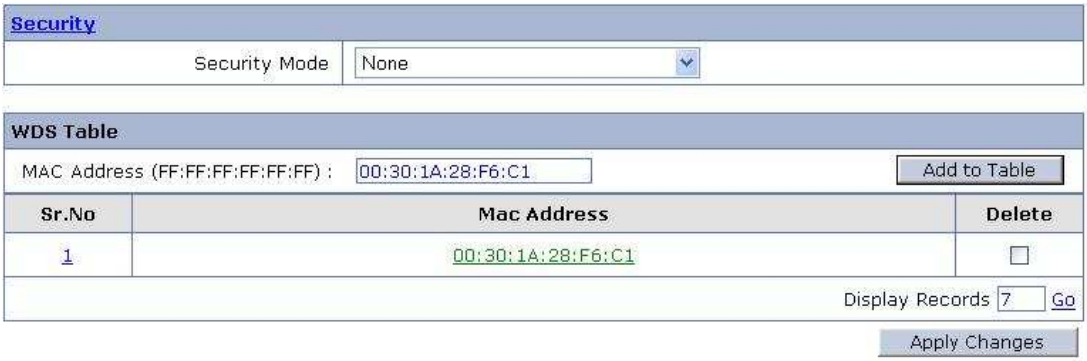

Figure 8 - WDS Table with Remote Radio MAC Address

The aPNPT configuration is now completed.

Configuration – airClient Nexus PRO TOTAL (sB3412) in Bridge Mode

Default IP address and Login Information: aCNPT (sB3412)

Default IP address (sB3412)	192.168.0.210
Login URL	http://192.168.0.210
User Name	Administrator
Password	smartBridges

To log in to the aCNPT using the default IP follow the steps below:

1. Launch the web browser (e.g. Internet Explorer) and use the default IP address to log in with the user name and password as given above.

Figure 9a - GUI Login

Figure 9b - Login Screen

2. Upon logging in, you will see the agreement page. Read and click **OK** to accept the agreement.
3. You can now navigate the menu of aCNPT.

Note: To login to the aCNPT, the connected laptop/computer must be in same subnet.

The default Operation mode is NAT Mode.

IP Address Assignment for 2nd unit (Bridge)

Units	IP Address
aCNPT –2nd Unit	192.168.0.10 / 255.255.255.0
Laptop / Computer **2**	192.168.0.216/255.255.255.0

A) Operation Mode Configuration:

To change the mode of operation of the aCNPT from NAT mode (Default Mode) to Bridge mode and its required IP address, follow the steps below:

1. Go to Tools | System Configuration.
2. Check the 'Current Operational Mode' as airClient **Bridge**.
3. Click **Apply Changes**. A small window will pop up to confirm the configuration.
4. Fill in the required details including the MAC address, domain and channel of aPNPT together with aCNPT's new required IP address at the same time.

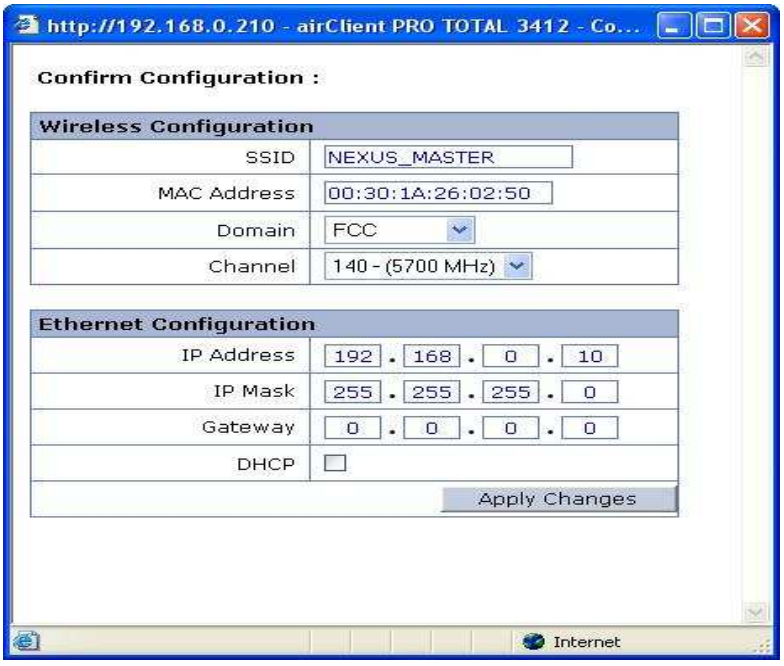

Figure 10 - Configuration during Mode Change

5. Click "**Apply Changes**" to change the settings

Figure 11 - Saving Configuration

6. Click **OK** to save configuration.

The aCNPT configuration is now completed.

Association Status

After the settings are applied, log in to the aCNPT with the new IP address. Click on Home → Summary Info and observe the RSSI (dBm) value which shows the association.

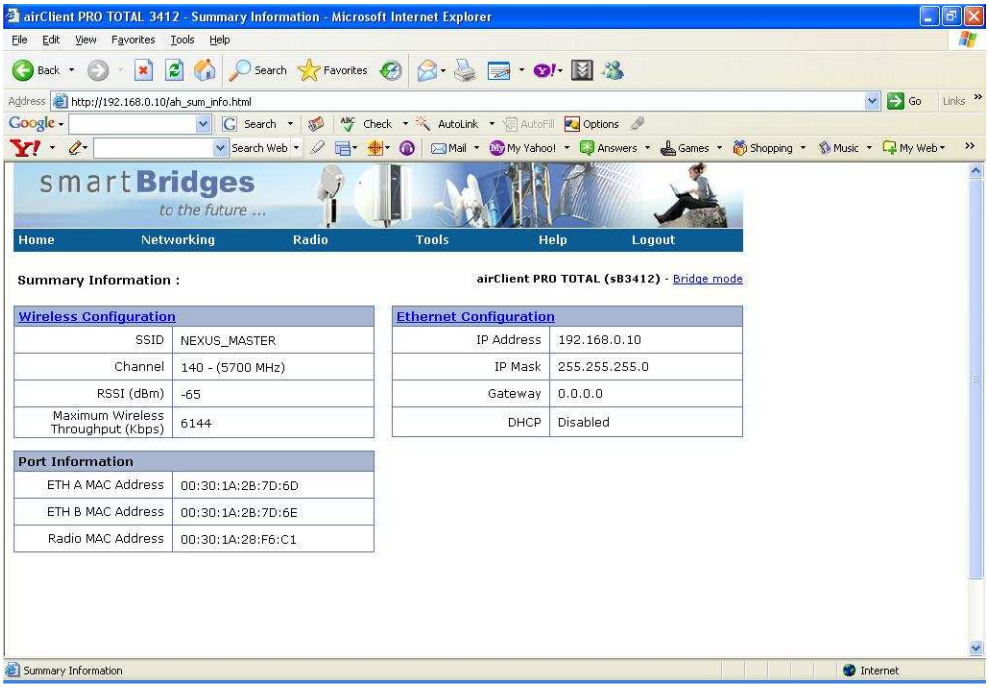

Figure 12 - Association Status in Main Page

Note: In Bridge mode, association is based on channel and MAC authorization only. ESSID will not be used for setting up a link.

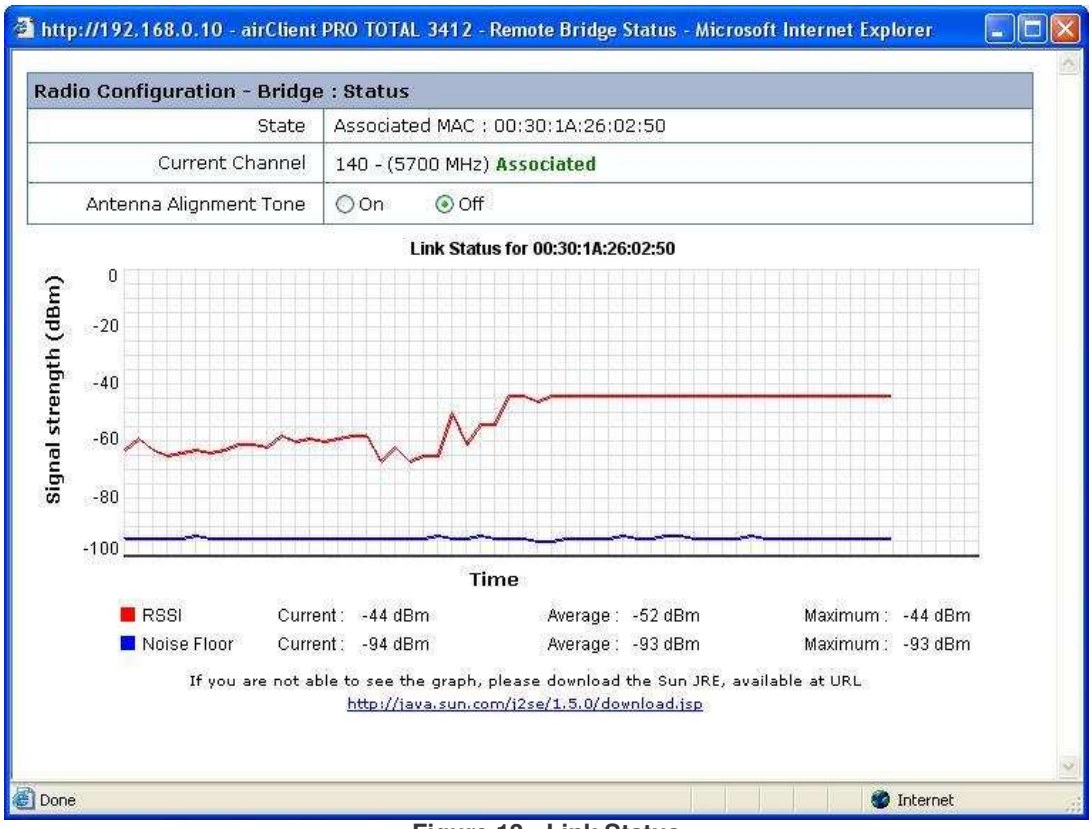

Figure 13 - Link Status

Note:

- The recommended minimum RSSI is -75 and higher for a stable link. Antenna alignment is very important factor in achieving an optimal RSSI.
- The link status graph will show the Noise Floor level in blue and RSSI level in red. As a guideline, the recommended signal to noise ratio (SNR) is 15 dBm and above.
- RSSI THRESHOLD is a squelch control function (under radio performance page) to ignore certain levels of noise received by the device.
- Verify the RSSI threshold level set on the Radio Performance page.
- It is highly recommended to set this value above your current noise floor to ensure optimal performance and device reliability. For example, if the average noise floor level is -88 dBm, offset it by a few dBm by setting the RSSI Threshold to -85dBm, so that any signal below -85dbm (such as -86, -87, -88 and so on) will be ignored by the device.

Link Test

Link Test tools are available from the navigation menu bar Tools | Link Test drop down menu and help to verify the link connectivity and measure the throughput on the link.

Ping Test Tool

This tool is provided to test the ping response between the two points in a wireless link to ensure that the wireless link is communicating. You can use this tool to verify the wireless connectivity without having to go to the remote site.

Follow the steps below to do a **Ping Test**:

1. Enter a valid IP address for remote radio.
2. Key in the count – 5.
3. Click on the '**Start**' button under 'Ping'.
4. The Ping Test result will be displayed.

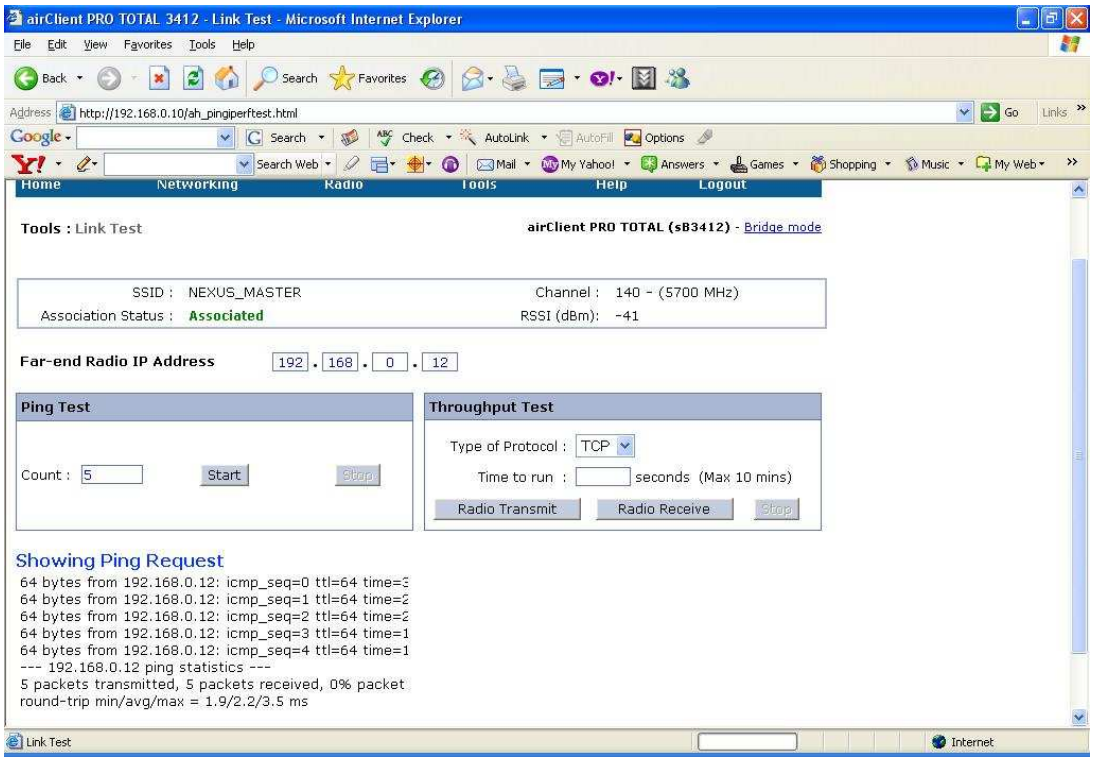

Figure 14 - Ping Test Result

Throughput Test

Follow the steps below to do a Throughput Test:

1. Set up a link between aPNPT and aCNPT as explained earlier.
2. Enter a valid IP address for the remote radio.
3. Type of Protocol – TCP/UDP – Testing can be done for both the protocols.
4. Enter Time on run - 60.
5. Click the '**Radio Transmit**' button under the Throughput Test and it will automatically start the Transmit from the radio on the other end.
6. The Throughput Test will start and the result will be displayed.
7. Click the '**Stop**' button to stop the test.
8. You can also similarly test for Radio Receive.

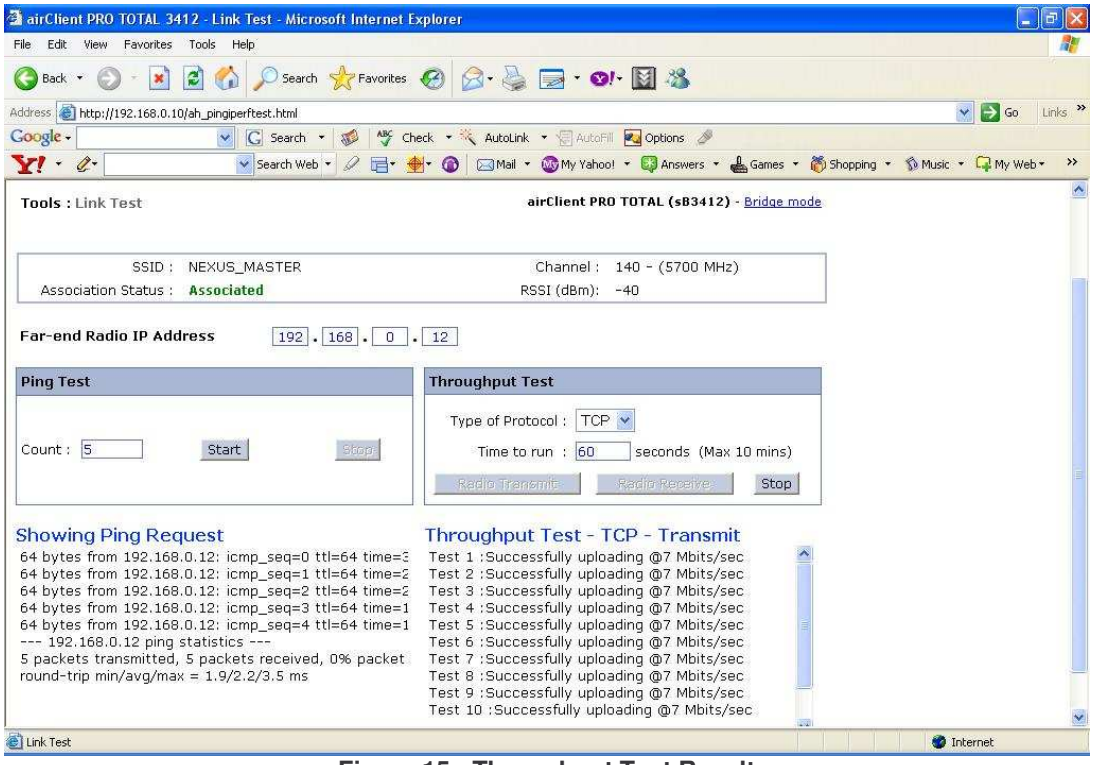

Figure 15 - Throughput Test Result

Note: If the throughput shown is not stable or it is fluctuating, please go to the "Radio Performance" page and adjust the throughput optimizer to achieve a stable throughput.

A smaller "Throughput Optimizer" value means a more stable link. A higher value will cause the radio to attempt to establish at the highest possible data rate in an aggressive way.

Performance Parameters

The Nexus Performance Parameters can be edited to optimize the link performance. In some wireless network situations, the performance parameters can be adjusted to fine tune the network and improve the link performance.

The performance settings can be accessed from the main page of the Nexus GUI.

Performance			
Fragment Length (256 - 2346)	2346	RTS / CTS Length (256 - 2346)	2346
RSSI Threshold	-90	Preamble Settings	Long
Radio Operating mode	sB Enhanced Mode (Compression Off)		
Distance	1 Km		
Frame bursting	On	Concatenation	Off
Piggy back	Off		
Throughput Optimizer (0 - 10)	6		

Figure 16 - Radio Performance

Other information:

Please upgrade the unit firmware to the latest version. You can download it from the Support Center web page at www.smartbridges.com/support.

The User Guides contain more detailed instructions on configurations. The aPNPT User Guide can be downloaded from this link:
http://www.smartbridges.com/support/apnpt.asp

The aCNPT User Guide can be downloaded from this link:
http://www.smartbridges.com/support/aCNPT.asp

More information can be found in the Frequently Asked Questions page on the Support Center website:
http://www.smartbridges.com/support/index.asp

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