

ProCurve Networking

Troubleshooting WLAN Connectivity

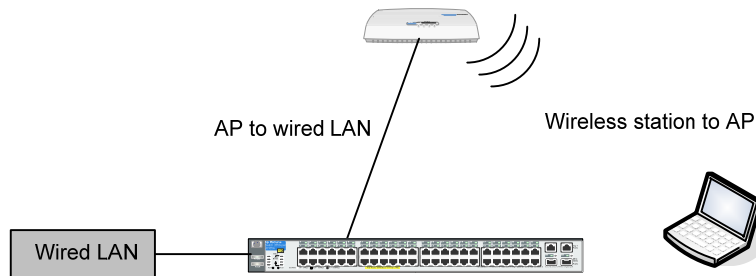
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Technical White paper

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Introduction

This document provides information to help identify and troubleshoot common problems in a wireless LAN in which there is at least one access point (AP) connected to a wired LAN and one or more wireless stations.



ProCurve wireless access points operate best when loaded with the most current version of software. Upgrade to the latest version of software early within the troubleshooting process.

Identifying the Problem

A clear understanding of any problem is the first step to find a solution. This principle also applies to networking issues. Networks consist of many pieces that work together to achieve a common goal of interconnection. You must understand the contribution that each piece makes to that interconnection and the challenges and faults that each piece can encounter.

Wireless LAN issues usually fall into the following areas:

- Wireless station issues
- Access point issues
- Server or infrastructure issues

Troubleshooting is a skill learned through experience with trial and error. One methodology is to develop a process to check for symptoms, identify the problem, find the source of the problem, attempt a repair and check the results. Since this is a process of elimination, it's a good idea to log everything you do, what changes you make, what works, what doesn't, and so forth. Keeping track of your steps will help you from duplicating your efforts and allow you to remain focused on finding a resolution. Additionally, this information can be useful for troubleshooting future problems.

Troubleshooting Wireless Station Connection to AP

Can Any Wireless Stations Connect to the AP?

When you troubleshoot problems with wireless stations, you must isolate whether the symptom is displayed on a single station or all stations. If the symptoms are the same with all stations, the problem can be the AP configuration, rather than the station.

Troubleshooting Wireless Stations

Check the station's state:

- √ Wireless network detected?
- √ Signal interference?
- √ Station associated?

Check the wireless NIC:

- √ Properly installed?
- √ Up-to-date drivers?
- √ Enabled?
- √ TCP/IP installed and set to receive a DHCP address?

Check the wireless LAN settings:

- √ SSIDs are case sensitive
- √ Station configuration
- √ WLAN's security requirements

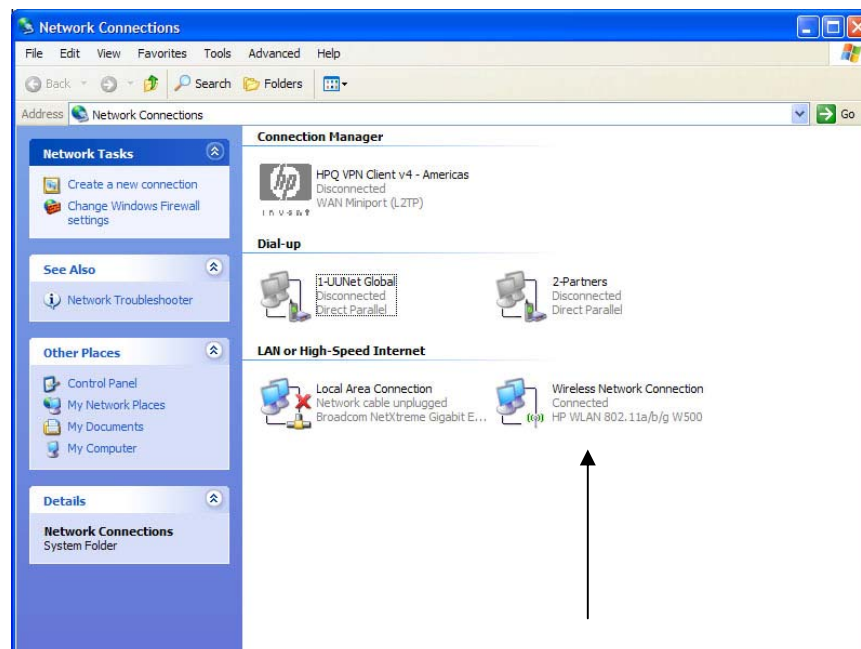
Check the station's status on the AP

Wireless Network Detected

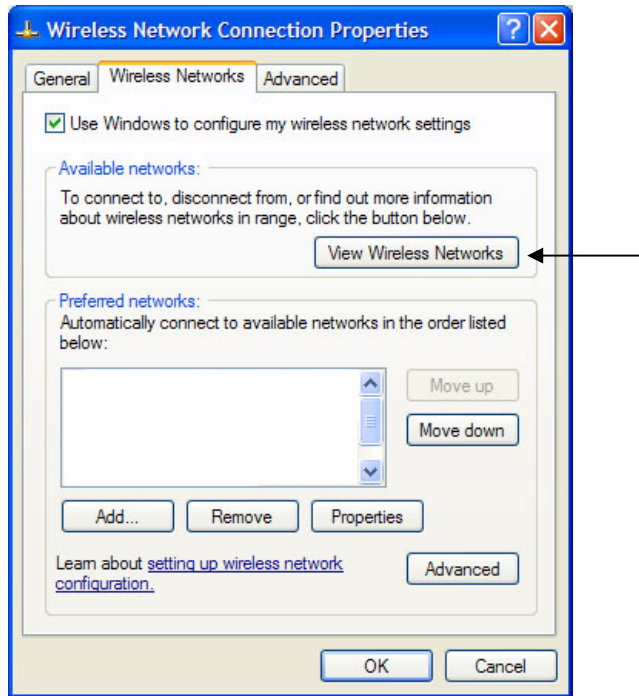
The wireless station must be within range of the AP in order to receive a radio signal (RF energy) strong enough for a connection to occur and be maintained.

For example if you are using the native Windows Wireless Zero Configuration software:

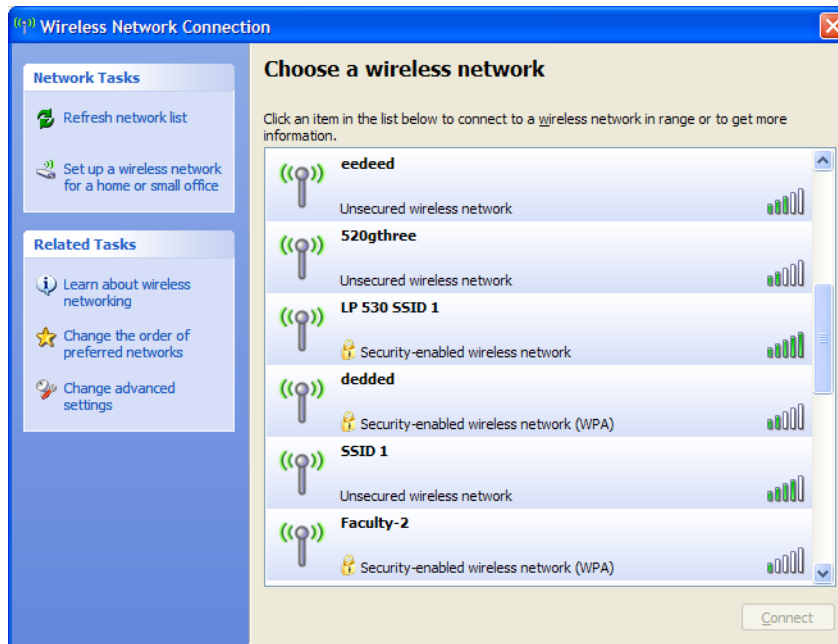
Open up the "Network Connections" page



Right click on the "Wireless Network Connection"



Select "View Wireless Networks"



A list of available wireless networks will be displayed with a status bar indicating their signal strength. Either you will see the AP or you will not see the AP listed. To connect, highlight the access point in the list and click the Connect button. If you can associate to the AP, then your wireless card is most likely operating correctly.

If you do not see the wireless AP in the list and the radio on your wireless card is enabled, the problem is most likely with the AP.

If you see the AP listed, but the status bar is indicating low signal strength, you may be almost out of range of the AP or there could be signal interference.

If the AP is configured as a "closed system," it prohibits the broadcasting of the SSID announcements and the SSID will have to be manually configured under the "Advanced" settings of the wireless station in order to connect.

Signal Interference

There are a number of factors which can play a role in radio signal interference. It could be caused by the antenna on the AP not being connected or properly installed. Building construction materials, such as steel and wood, and objects with high water content absorb RF energy and affect signal strength. Interference from devices such as microwave ovens and 2.4 MHz cordless phones can cause RF interference and should be considered when placing the AP. Stronger signals are not always better signals! In an enclosed area, radio signals that are excessively strong may be reflected (bounce off) off objects and cause multipath interference. For more information on wireless LAN training, visit the [ProCurve Networking by HP Technical Training](#) webpage.

Site Survey

A site survey is strongly recommended prior to installation of a wireless network and should be performed on the actual site under normal operating conditions. Such a survey is critical because the RF behavior varies with the physical properties of the site. You cannot accurately predict the behavior without doing a site survey. You may face intermittent connectivity in certain locations or during certain environmental conditions. The intermittent connectivity can indicate that a site survey was not performed or that the site survey did not consider these factors and placement of the APs should be re-evaluated.

Station Status

Use the Web user interface of the AP to view the wireless station status. Check station status to see if wireless stations are associated with the AP. The Event log of the AP also displays valuable information on why or why not a station may not be associating to the AP.

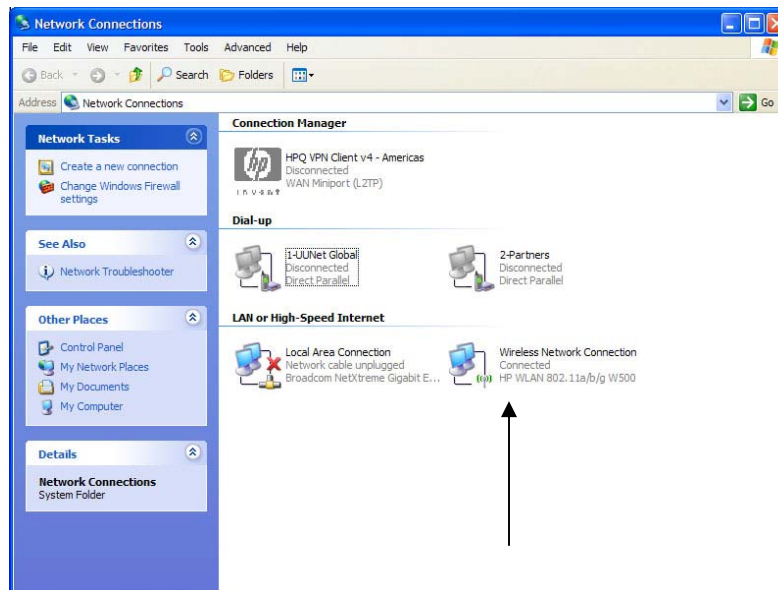
Using the Correct SSID

SSIDs are case sensitive and some special characters are allowed (spaces), so verify that the station has an exact match for the WLAN's SSID configured on the AP.

Station Configuration

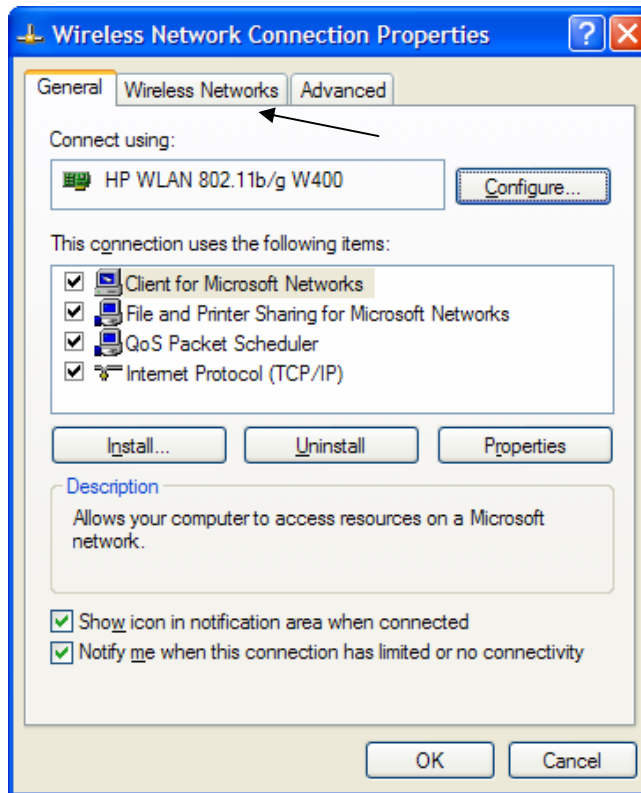
Open the station configuration utility on your computer or if using the Windows Wireless Zero Configuration software:

Open up the "Network Connections" page



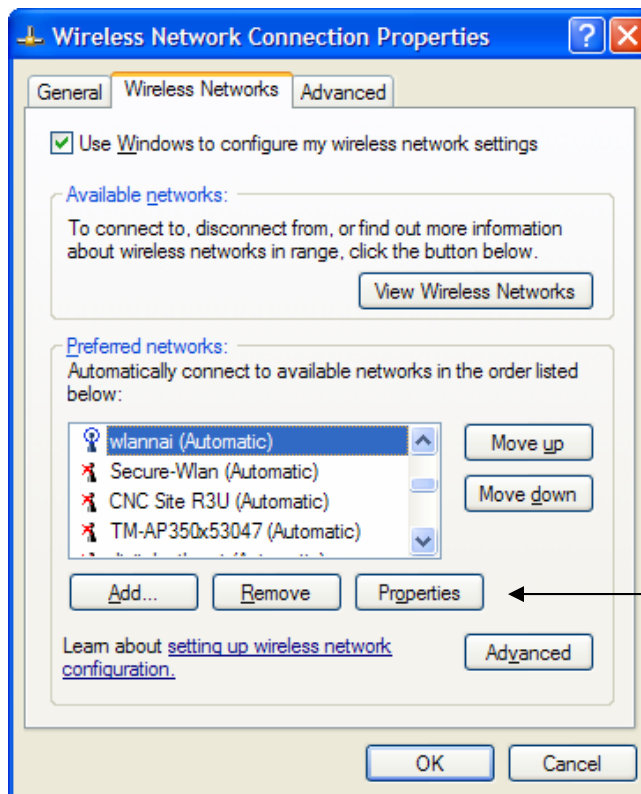
Right click on the "Wireless Network Connection"

Select "Properties"



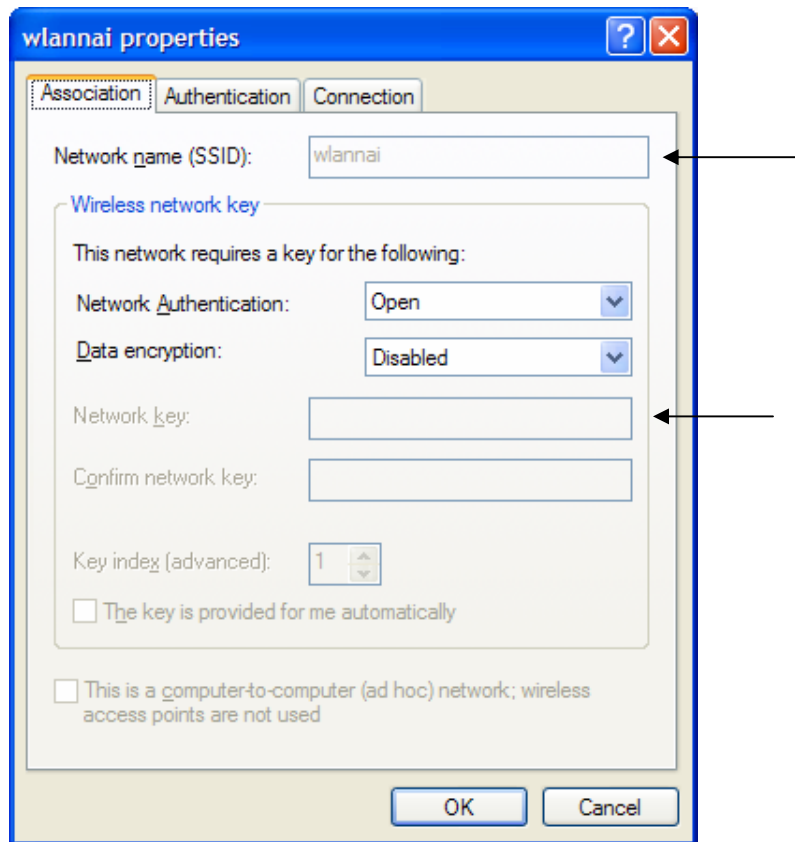
Click on the "Wireless Networks" tab

In the Preferred networks window, highlight the wireless network that you want to connect



Click on the "Properties" button

The network properties page is displayed



Here you can verify that the SSID and the Wireless Network Key (if applicable) are configured exactly to match the configuration on the AP.

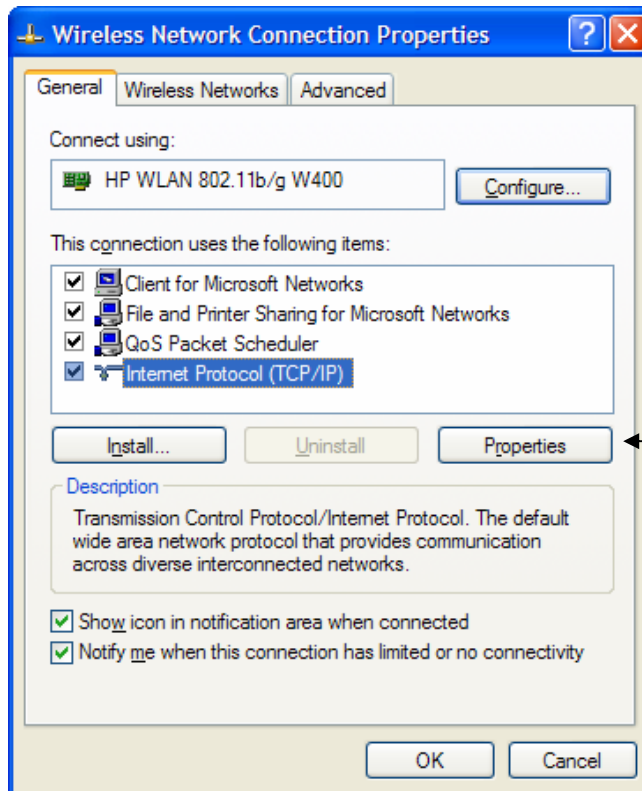
Correct Security Settings

Another reason the wireless station may not be associating is the security settings. These must match exactly. For example, if your network requires static WEP keys and you don't have any configured, you will not be allowed to connect to the network. The reverse of this is also true: If your station has WEP configured and your network is wide open with no keys, most stations will not connect in this situation either. Of course, these rules also apply for more advanced security schemes.

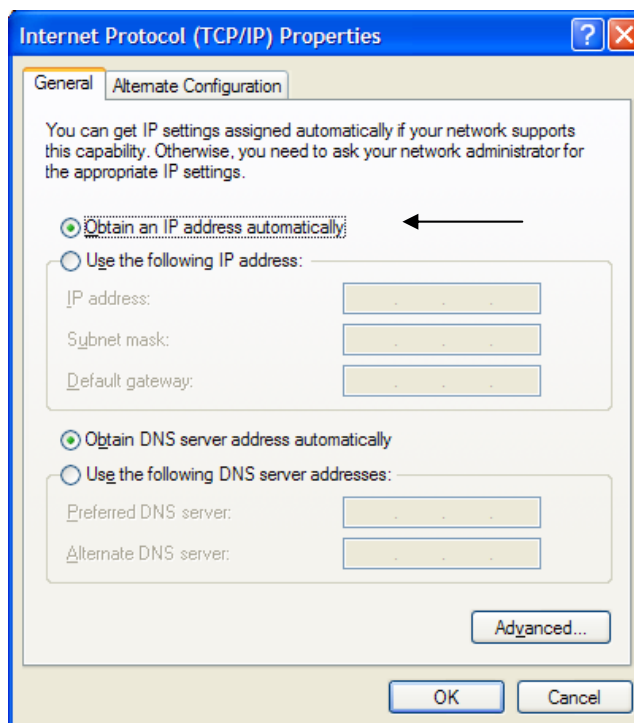
TCP/IP Protocol Installed and Configured

The AP can also be configured to work with a DHCP server in order to provide the IP addresses to the wireless stations. Check and verify the wireless network connection is installed and configured properly to receive an IP address from a DHCP server.

- Open up the "Network Connections" page
- right click on the "Wireless Network Connection"
- select "Properties"



The Wireless Network Properties Connection Properties page is displayed. The Internet Protocol (TCP/IP) will be displayed in the connection window. Highlight the Internet Protocol and click "Properties."



Ensure the radio button for "Obtain an IP address automatically" is selected. This will allow the station to receive an IP address automatically from a DHCP server.

Troubleshooting AP Connection to Wired LAN

First, try to ping the AP from a management station or a wired station.

If the ping is successful, this means the AP is connected and reachable on the wired network.

If the ping fails, you may have a problem with the AP or wired connection to the AP.

Possible causes:

- Is the AP powered on?
- Is the AP radio enabled?
- Is the appropriate country code set on the AP (if applicable)?
- Is the network switch that connects to the AP powered up?
- Is there a link LED on the switch port to which the AP is connected?
- Does the LAN LED on AP show activity?
- If all of the above conditions are functional, the AP may not have an IP address, or may have an IP address that does not match the wired network's IP scheme.

By default, the ProCurve APs are configured to acquire an IP address configuration from a DHCP server. If the AP does not receive a valid response from your network's DHCP server, the AP will revert to its default IP address:

- default address of 192.168.1.1 (AP 420)
- default address of 192.168.1.10 (AP 530)

If you are not using a DHCP server to configure IP addressing on your network, use the AP's command line interface (CLI) to manually configure the initial IP values. Step-by-step instructions can be found in your product's installation guide. After you have network access to the AP, you can use the Web browser interface to modify the AP configuration, if needed.

Port Configuration on Wired/Wireless

There are two sides to every connection. This applies to the connection between the AP and the rest of the wired network as well. The speed and duplex capabilities should match as closely as possible. ProCurve recommends allowing both ends of the connection to autonegotiate speed and duplex settings. Give equal attention to the switch port to which the AP is connected and to the AP's Ethernet port.

Network Cable

Physical connectivity between the AP and wired network is often overlooked, but is the basis of communications between the two networks. If you have intermittent connectivity or connectivity with errors, the cable connection may be loose or there is a possibility that the cable length is greater than the recommended Ethernet segment length. Be sure that an AP is connected to a switch with a straight through cable. Do not exceed the Ethernet cable length recommendation of a Category 5e 10/100BASE-TX 100 m/328 ft.

Interference occurs when you run a network cable near high power equipment. This interference is especially common when you run the cables in warehouses and factories. Replace the network cable if intermittent problems exist between the AP and the wired network.

Troubleshooting the AP

Check the hardware and software:

- √ Power operating & stable?
- √ Up-to-date software image and configuration file?
- √ Indicator LEDs

Check the radio:

- √ Is the country code set (if applicable)?
- √ Is the AP radio enabled?
- √ Is the SSID enabled?
- √ Is AP detection scanning turned off?

Check for mismatches in:

- √ SSID (including case and spaces)
- √ WEP key or WPA preshared key
- √ Radio settings (frequency and speed)
- √ Is the IP configuration in the same subnet as the wired switch connection?

Check for Power Issues with the AP

If using the AC power adapter, ensure that the power source circuit is active, properly grounded and the power cable is securely plugged into the AC outlet and the back of the AP.

If using Power over Ethernet (PoE), make sure the AP is connected to a switch which can provide the necessary power to the AP.

Check for Booting Issues with the AP

In some cases, the AP fails to boot completely. This failure can happen if the software on the access point is corrupt. In order to resolve this issue, reinstall the software on the AP.

Check AP LED Behavior

AP 530

During the system initialization:

The Power LED first turns on immediately, then the Power, LAN, Radio 1, and Radio 2 LEDs turn on and off several times during phases of the initialization.

When the system initialization completes successfully:

- The **Power** LED remains on green.
- The **LAN** and **Radio** LEDs on the top of the access point go into their normal operational mode:
 - If the RJ-45 network port and radio interfaces are connected to active network devices, the LEDs should be blinking at a rate proportional to the traffic rate. If there is no network activity, the LEDs should still be blinking at approximately 5 second intervals.
 - If the RJ-45 network port is not connected to an active network device and the radio interfaces are disabled, the LEDs should be off.

If the LED display is different than what is described above, the system initialization has not completed correctly.

AP 420

During the self test:

The 10/100Base-TX and Wireless LEDs go off and then may come on again during phases of the self test. For the duration of the self test, the Power LED blinks.

When the self test completes successfully:

- The **Power** LED remains on.
- The **10/100Base-TX** and **Wireless** LEDs on the top of the access point go into their normal operational mode:
 - If the ports are connected to active network devices, the LEDs should be on.
 - If the ports are not connected to active network devices, the LEDs stay off.

If the LED display is different than what is described above, especially if the **Power** LED does not stop blinking, the self test has not completed correctly.

Check AP Has Correct IP Address

If you cannot ping the AP, check the IP addresses that are assigned to the AP and wireless station. Make sure that they are in the same subnet.

For example, if the IP address of the AP is 10.20.50.25 with a mask of 255.255.255.0, verify that the IP address of the station adapter is similar to 10.20.50.X with a mask of 255.255.255.0.

Check AP is Broadcasting the SSID

The “broadcasting the SSID” setting allows you to choose whether wireless stations that do not specify an SSID are allowed to associate with the AP. When configuring a wireless LAN interface on the AP, ensure the Closed-System check box is unchecked.

Closed-System: Prohibits the broadcasting of the AP’s SSID, if enabled. The network name will also not be displayed in the List of Available Networks on a wireless station. (Default is disabled, allowing SSID broadcasting)

If you have communication problems and the access point Closed-System check box is checked (enabled), change the setting to uncheck the box and see if the wireless station can communicate. Leave the setting as unchecked for the duration of this troubleshoot.

Check AP Radio Settings

The data rate setting on the AP radio defines the rate at which the AP transmits information.

When you configure the AP radio, you must consider the type of wireless stations that are present in the wireless network. If the AP has the radio mode set as an 802.11g radio, then only 802.11g wireless stations on the WLAN will be able to connect.

However, if you have a mixed environment of both 802.11b and 802.11g stations in a WLAN network, you must ensure that the AP radio mode is set to 802.11b/g. When working in its mixed “b/g” mode, the AP will experience reduced data throughput, even if there are no 802.11b stations active in the network.

Additional Information

For more information, see the Troubleshooting sections of the ProCurve wireless access point *Installation and Getting Started Guide* and the *Management and Configuration Guide*.

For the latest version of the *Installation and Getting Started Guide* and other documentation for your access point, visit to the [ProCurve Networking](#) Website.

To find out more about
ProCurve Networking
products and solutions,
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www.procurve.com



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