Optimizing location

After powering on the SkyAccess DualBand, use the device's LEDs to identify the optimal location for mounting—a location where it can easily acquire a signal from the wireless mesh network and quickly create links.

Confirm signal acquisition

- Position the SkyAccess DualBand near the intended mounting location and watch the WAN Act LED for activity.

  The LED starts to blink when it has acquired a signal from the network and is attempting to set up a connection.

  If the WAN Act LED does not start blinking within 30 seconds, try changing the orientation of the SkyAccess DualBand or walk to a new location; then repeat the process until the LED begins blinking.

  When the LED starts blinking, make minor adjustments to find the location where the signal is strongest. (The faster the LED blinks, the stronger the signal.)

  When the WAN Act LED blinks steadily and at a high rate, you have an optimal signal. Go to the next section to verify the network connection.

Verify network connection

- Watch the WAN Link LED for activity.

  Within approximately 90 seconds of locating a signal, the WAN Link LED should start to blink—first slowly, then more quickly.

  When the WAN Link LED is solid and the WAN Act LED is blinking, the SkyAccess DualBand has established an authorized connection to the network, indicating that the current location is suitable for mounting

  If both the WAN Act LED and the WAN Link LED continuing blinking, a signal is available but is not strong enough for reliable service. Keep trying different locations until you can confirm a network connection.

NOTE To optimize your SkyAccess DualBand installation, ask your network administrator (at the Network Operations Center) to measure signal strength on the node to which the SkyAccess DualBand has established a link.

For more information on LED states, see Table 1.

Table 1. SkyAccess LED states

| LED	LED state	Device state
LAN Link	Steady illumination	SkyAccess DualBand is connected to another device via its Ethernet port.
LAN Act	Blinking	Device is transmitting or receiving data via its Ethernet port.
PWR	Steady illumination	Device is powered on.
WAN Link	Blinking (fast blink when device is in standby mode)	Device is attempting to establish an authorized connection on the wireless network. If both WAN Link and WAN Act continue to blink, the signal is not strong enough to support reliable service or there is a provisioning problem that's preventing the device from coming online. Contact your network administrator.
	Steady illumination	Device is connected to the wireless network.
WAN Act	None	Device cannot detect a wireless network.
	Blinking	Device is within the coverage area of a wireless network. Blink rate communicates signal strength: • Fast (8x per second) = excellent • Medium (4x per second) = good • Slow (<1x per second) = poor • None = no reception

Mounting the SkyAccess DualBand

After determining an optimal location the SkyAccess DualBand can then be mounted in accordance with the procedure below.

Before mounting the device, disconnect the CAT5 cable from the power injector to power down the device.

1   Connect the 2.4 GHz antenna.

To provide Wi-Fi connectivity, the SkyAccess DualBand requires attachment of the 2.4 GHz antenna included with the device. Screw the antenna onto the standard N connector on the back of the SkyAccess DualBand.

Figure 8. Attaching the 2.4 GHz antenna
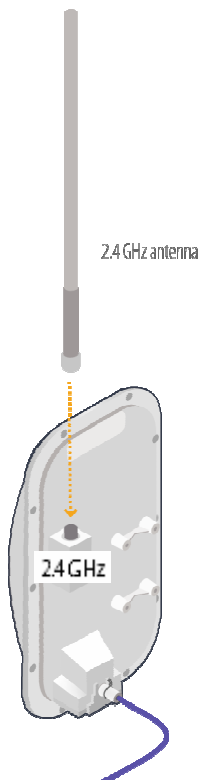
2   Use the supplied clamps to secure the SkyAccess DualBand to the pole; then loop the Ethernet cable around the mounting pole and secure it with tie wraps.

Figure 9. Securing the SkyAccess DualBand
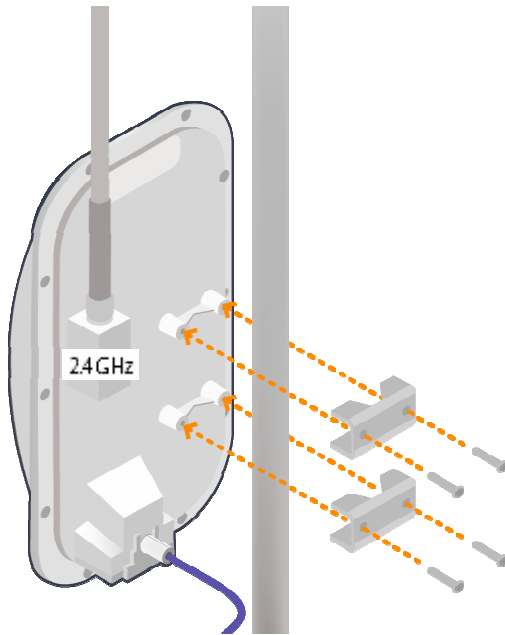
Tighten the bolts securely on the mounting hardware.

3   Reconnect the CAT5 cable to the port on the power injector to restore power to the SkyAccess DualBand.

Connecting to the wireless network

After mounting the SkyAccess DualBand, set up a connection to the wireless network via a local computer or LAN. Once connected, a subscriber can use the wireless network to gain access to Internet services and applications.

Connection to the SkyAccess DualBand is accomplished with Ethernet, or through the onboard access point to establish a wireless connection.

```
Connect    to    the    wireless    network    with
Ethernet
```

- Connect the device to a computer or LAN (for a SkyAccess DualBand that's providing Internet/WAN access to the mesh network).

  Connect a second Ethernet cable from the power injector port labeled "Computer" to a personal computer or router/data switch providing a connection to a LAN.

Figure 10. Connecting a SkyAccess DualBand to a computer
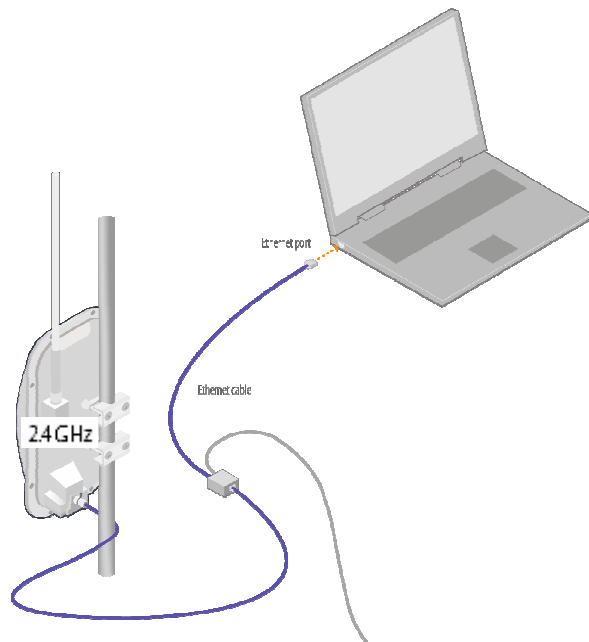
Connect to the wireless network via a Wi-Fi connection

1   From a Wi-Fi/WPA-PSK capable computer within operating range of the access point, open the Network control panel and set up a wireless connection with the IP address 192.168.0.10 and Netmask 255.255.255.0.

2   From the Network Connection control panel choose the default SSID provided with the SkyAccess DualBand— `SkyAccessDualBand`".

3   At the password prompt, enter `publicpublic`".

Configuring the SkyAccess DualBand

A SkyAccess DualBand requires two different configurations: a network configuration that allows it to operate on the wireless mesh network, and an access point configuration that allows the device to support local wireless connections via Wi-Fi.

For information about configuring both the device and the access point, see the document "SkyPilot Network Administration", available in electronic format from the SkyPilot website at www.skypilot.com/support/.

Accessing SkyAccess DualBand Command-Line Interfaces

This appendix describes how to access the command-line interfaces that SkyPilot SkyAccess DualBand provides for provisioning and troubleshooting. You can connect to two different interfaces on the SkyAccess DualBand: an interface with the device that operates as a node on the wireless mesh network, and a separate interface with the access point that extends Wi-Fi connectivity to subscribers.
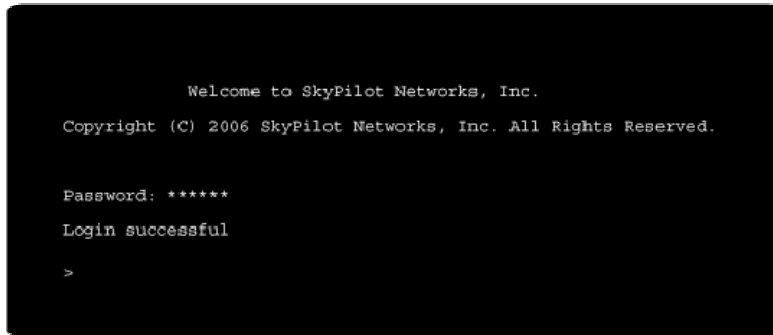
Connect to the SkyAccess interface

You can connect to a SkyAccess DualBand and access the command-line interface through Telnet over an Ethernet connection. After logging in (by supplying a password), you can enter commands at the command prompt.

1 Mount and cable the SkyAccess DualBand according to the instructions in Chapter 3.

2 Prepare a PC or laptop.

   Open the network settings panel and assign the computer the IP address 192.168.0.3 with a subnet mask of 255.255.255.0.

3 Connect the computer to the SkyAccess DualBand according to the instructions in Chapter 3 (see on page **Error! Bookmark not defined.**).

4 Start a Telnet session.

Telnet to the default IP address of the SkyAccess DualBand (192.168.0.2).

5   Log in by entering the password at the command prompt. (The default is `public`.)

Figure 11. Example Telnet login

After making an Ethernet connection to the SkyAccess DualBand, you can manage and troubleshoot the device using a wide range of commands available through the command-line interface. For detailed descriptions of the commands, as well as sample output for many of them, see `SkyPilot Network Administration`.

For comprehensive guidelines to troubleshooting devices on your SkyPilot wireless mesh network, see `Getting Started with the SkyPilot Network`.

Connect to the access point interface

You can connect to the access point command-line interface via Telnet over a wireless network connection. (Typically, you will use this technique to confirm the IP address of the access point component of the SkyPilot DualBand.)

1   Prepare a PC or laptop.

You will need a Wi-Fi/WPA-PSK capable computer that's within operating range of the access point and a Telnet application you can use to open a connection between the devices.

The access point component of SkyAccess DualBand ships with the default IP address `192.168.0.3.`

2   Open the connection to the access point.

From your Telnet application, open a connection to the access point.

3   Log in by entering the default user name (admin) and password (public) at the command prompt.

Once you're logged in, you can use the command-line interface to set configuration parameters or retrieve the IP address of the access point

FCC Regulatory Information

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

o   Reorient or relocate the receiving antenna.

o   Increase the separation between the equipment and receiver.

o   Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

o   Consult the dealer or an experienced radio/TV technician for help.

The user of this product is cautioned that changes or modifications made to the equipment without the approval of the manufacturer void the user's authority to operate the equipment.

FCC Radiation Exposure Limits

To comply with FCC RF exposure requirements in section 1.1307, a minimum separation distance of 40 cm (16 inches) is required between the antenna and all persons.

Specifications

This appendix provides technical specifications for the SkyPilot SkyAccess DualBand.

Wireless Specifications	
Frequency bands capable US & Canada	
SP 3501	5.5GHz to 5.725GHz
SP 3604	5.26 GHz to 5.32 GHz
	Wi-Fi Access: 2.400-2.491 GHz
For other countries check with sales representative	
EIRP	29 dBm/0.9 W peak,
	Wi-Fi Access: 35.0 dBm / 3.2 W
Media access	Time Division Duplex (TDD)
Modulation technique	OFDM with adaptive modulation
	Wi-Fi Access: DSSS and OFDM
Modulation rates	6–54 Mbps
Throughput	Up to 20 Mbps UDP, up to 10 Mbps TCP
Latency	8–10 ms roundtrip per hop
Antennas	28° horizontal x 9° vertical panel, 16.5 dBi
	Wi-Fi Access: omnidirectional 9 dBi antenna

	with diversity
Channel width	20 MHz
Channel resolution	5 MHz frequency control
Receive sensitivity	-90 dBm at 6 Mbps modulation
Connectivity	SkyAccess DualBand connects with SkyGateways, SkyExtenders, and SkyExtender DualBands
Authentication	MD5-based certificates
Encryption	128-bit AES on all wireless links

Product Specifications

Connectors	RJ-45: Ethernet connection (10/100bT) and power (Power-over-Ethernet)
Mounting	Eave, roof, or chimney; outside pole diameter up to 2.0"
Range	7.5 miles (12 km)
	Wi-Fi Access: Up to 1,200 feet
LEDs	Wireless activity, wireless link, LAN activity, LAN link, and power
Dimensions	12.6" (32 cm) H x 6.6" (16.8 cm) W x 4.2" (10.7 cm) D
Weight	3.8 pounds (1.7 kg)
Operating temperature	-40° to 131° F (-40° to 55° C)
Wind loading	Up to 150 mph (240 km/h)
Enclosure/humidity	NEMA-4X
Power	110–230 VAC, 50–60 Hz input; 8 W

Certifications	FCC Part 9, FCC 47 CFR Part 15, Class B USA; compliance with UL safety standards,
EMI and susceptibility	FCC Part 15.107 and 15.109
Warranty	One-year limited warranty on hardware and software

Security

Authentication	MD5-based certificates
Encryption	AES
Filtering	Based on protocol type, IP port ID, and configurable IP address list
VLAN	Supports 802.1q VLAN tagging; supports a management VLAN for managing traffic and a data VLAN for subscriber traffic

Network Management

Command-line interface	Console via Telnet
NMS integration	SNMP v2c
GUI configuration	SkyProvision™ software and Web interface
GUI EMS	SkyControl™ software
IP address	DHCP or static
Firmware	Multiple versions of firmware stored in nonvolatile memory; updated via FTP
Configuration file	XML over HTTP

Quality of Service

Prioritization	802.1p-based; based on protocol type, IP address, port ID, and configurable IP address list
Traffic shaping	Per-device rate limits upstream and downstream

Monitoring and MIB Support

Supported MIBs	MIB-II (RFC 1213); EtherLike (RFC 2665); Bridge (RFC 1493); SkyPilot private MIB
Local management	RS-232 Serial Console Port
Remote management	Command-line interface via Telnet, SNMP v2c, Web interface

Topology

Configurations	Mesh, point-to-multipoint, point-to-point