SkyPilot
SkyAccess DualBand
Installation

Contents

About This Guide

This guide explains how to install and set up a SkyPilot™ SkyAccess™ DualBand that provides access to a SkyPilot wireless mesh network and serves as an access point for users of 802.1x wireless (Wi-Fi).

This guide assumes administrator-level knowledge of IP networks and a familiarity with configuring wireless devices.

Overview

SkyAccess DualBand is a dual-radio solution that combines SkyPilot's long- range, high-capacity 5 GHz mesh backhaul with a high-powered 802.11b/g access point that lets service providers and municipalities offer standard Wi-Fi to subscribers.

Features and benefits

SkyAccess DualBand provides a highly flexible wireless solution that combines scalable Wi-Fi capacity with the seamless coverage of a wireless mesh network.

Each SkyAccess DualBand can support multiple WLANs (wireless local area networks), each with its own VLAN and security policy. One SkyAccess DualBand can support several business models with a single service installation.

About access point configuration

The SkyAccess DualBand access point is set up to provide Wi-Fi access right out of the box. The access point includes a preconfigured WLAN with the SSID (service set identifier) `SkyAccessDualBand`, providing WPA-PSK (Wi-Fi protected access – pre-shared key) protection. Users attempting to connect to the `SkyAccessDualBand` WLAN must provide a password (`publicpublic` by default). The default configuration is provided for initial management and configuration of the SkyAccess DualBand access point via a wireless connection. You should always create a unique access point configuration before testing the device or making it available to customers.

A wireless network protected by WPA-PSK is vulnerable. To provide a more secure level of protection, configure the WLAN for WPA authentication in which each user is authenticated separately.

SkyPilot network topology

SkyPilot Networks™ delivers a wireless, end-to-end broadband solution that seamlessly supports high-capacity, high-coverage mesh networks. Designed for managed-access networks and service providers, the SkyPilot network takes broadband wireless the "last mile" with a cost-effective, robust infrastructure solution.

Based on a high-performance architecture that deploys intelligent antenna arrays, the SkyPilot network delivers a dynamic broadband solution with significant advantages for business and home users.

SkyPilot wireless devices are simple to install and easily fit into any type of wireless environment—metropolitan, business, or home.

The auto-discovery and rapid provisioning features of a SkyPilot wireless mesh network greatly reduce deployment and maintenance costs. Support for multiple topologies and high scalability allow attractive options for rapidly expanding a metro Wi-Fi customer base.

A SkyPilot network (as illustrated in Figure 1) may include the following physical components:

- SkyGateway™ (required)

- SkyExtender™

- SkyExtender™ DualBand

- SkyConnector™ Indoor

- SkyConnector™ Outdoor

- SkyAccess™ DualBand

Figure 1. SkyPilot wireless mesh network

SkyExtender DualBand
A SkyExtender DualBand adds a Wi-Fi access point, providing 802.11 wireless access to the mesh network in metropolitan "hot" zones.

Wi-Fi zone

SkyConnector

SkyExtender

SkyExtender

SkyConnector
SkyConnectors link subscribers to the wireless mesh network via an Ethernet port that allows connection from a PC or a local area network.

SkyExtender
SkyExtenders increase the coverage footprint by extending the wireless mesh network beyond the range of the SkyGateway.

SkyGateway

SkyExtender

Internet

SkyConnector

SkyGateway

The SkyGateway operates as a base station for a wireless mesh network. It provides an interface between wired infrastructure and a wireless network of subscribers who enjoy secure, high-speed access to the Internet or to wide area networks (WANs).

A SkyPilot wireless network requires at least one SkyGateway for normal operation. If necessary, you can add additional SkyGateways to increase network capacity or provide redundancy.

The SkyGateway typically resides at a location with easy access to wired infrastructure—usually a POP (point of presence) or data center.

For optimal performance, install the SkyGateway on an elevated site such as a cell tower or the top of a tall building.

SkyExtender and SkyExtender DualBand

SkyExtenders and SkyExtender DualBands provide a cost-effective way to add capacity and balance network loads, by operating as "repeaters" to extend the wireless range of a SkyGateway (see Figure 1). You can add these devices to your network to expand your coverage footprint and provide redundancy through SkyPilot's mesh networking features. (A SkyExtender can also provide subscribers with a direct connection to the wireless network via its Ethernet port.)

In addition, the SkyExtender DualBand serves as a Wi-Fi access point, enabling service providers and municipalities to provide standard 802.11 wireless access across great distances, for targeted hot zones, or for dense coverage patterns.

For optimal performance, install the SkyExtender in an elevated location such as a roof, tower, or utility pole.

SkyConnector and SkyAccess DualBand

SkyConnectors link your subscribers to the SkyPilot wireless network. An Ethernet port on the SkyConnector enables a connection to be established to the subscribers' computers, or to a local area network (LAN) via a data switch or router. For flexibility of installation, SkyPilot offers indoor and outdoor versions of the SkyConnector.

Designed for installation by the service provider, the outdoor version of the SkyConnector attaches to an external structure such as an eave, roof, or pole. Because it provides a better line of sight to the SkyGateway or a SkyExtender, the outdoor SkyConnector generally offers greater range than the indoor unit.

The indoor version of the SkyConnector is a plug-and-play network device that a subscriber can easily install without technical assistance. Service providers should advise subscribers to place the SkyConnector

in a location with an optimal sight line to the SkyGateway or a SkyExtender.

SkyAccess DualBand offers the same features as a SkyConnector, plus a Wi-Fi access point that allows service providers and municipalities to provide standard 802.11 wireless access across great distances, for targeted hot zones, or for dense coverage patterns.
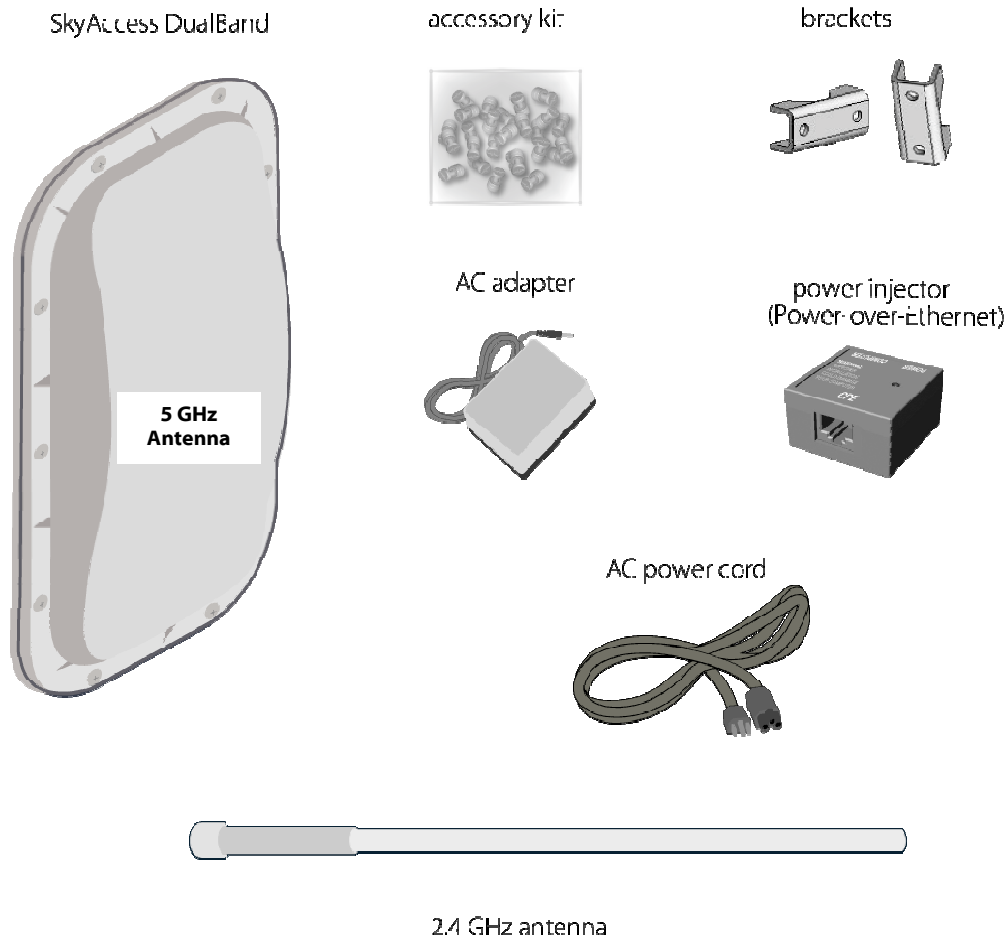
The SkyAccess DualBand Installation Kit

The SkyPilot SkyAccess DualBand must be *professionally installed* by a trained technician. The kit provides everything needed for the installer to mount and configure the device as both a connector to the wireless mesh network and an 802.11b/g Wi-Fi access point.

This chapter reviews the provided equipment to ensure that all parts are present in the kit prior to the technician starting installation.

NOTE Professional Installation is required to ensure that the proper antenna is employed such that FCC transmit power limits for this equipment are not exceeded.

What the kit provides

SkyAccess DualBand

accessory kit

brackets

AC adapter

power injector
(Power-over-Ethernet)

**5 GHz
Antenna**

AC power cord

2.4 GHz antenna

SkyPilot also offers accessories, including a tilt mount for optimizing SkyAccess DualBand installation. For more information, contact a SkyPilot sales representative.

NOTE The 5 GHz antenna is integrated into the dualband connector housing. The 2.4GHz antenna is the external antenna.

What else you need

Before starting installation, the following are needed:

- For basic mounting: A Phillips screwdriver

- For pole mounting:

    A magnetic level (optional)

    A secured steel pole between 1.13" (2.87 cm) and 1.37" (3.48 cm) in diameter

- For network cabling:

    A spool of CAT5 network cable (shielded cable is recommended)

    NOTE Ethernet cabling must comply with the requirements of NEC/CEC codes for outdoor CAT5 cables. The outer jacket of the cabling must be clearly marked as CAT5e per ANSI/TIA/EIA-568-B.2.

    Ethernet crossover cable (for connecting to data switch or router)

    RJ-45 connectors (connectors without a protective "boot" are recommended)

    RJ-45 crimping tool

- For wireless mesh network configuration: A laptop with a Telnet client application and a 10/100bT Ethernet network interface card

- Setup information for the access point:

    A (case-sensitive) wireless SSID for each virtual WLAN Wi-Fi network

    A unique IP address for the management of the access point if it's not connected to a DHCP server

    A default gateway and subnet mask for the management network if the access point is not on the same subnet as your PC

NOTE Plan on configuring the SkyAccess DualBand before mounting it. Some steps are easier if the access point is more accessible.

Getting help

For technical assistance, contact SkyPilot support by logging in to customer support at www.skypilot.com.

Installing a SkyAccess DualBand

This chapter provides instructions for planning and performing the physical installation of a SkyAccess DualBand.

NOTE Professional Installation is required to ensure that the proper antenna is employed such that FCC transmit power limits for this equipment are not exceeded.

Planning the installation

In a typical wide area wireless mesh network, a SkyAccess DualBand would be installed on a utility pole or the roof of a building. The effective range of the SkyAccess DualBand is usually proportional to the height of the installation.

When choosing a site for the device, consider the radio frequency (RF) environment and physical characteristics of the site.

Trees, buildings, and hills can block a wireless signal. Also keep in mind that the RF environment is dynamic and can deteriorate over time as obstacles appear or are relocated.

Testing potential sites to determine the suitability of the link topology for target applications is recommended. Once a potential site has been identified, use a topographic map or path profile software to ensure that terrain or obstacles will not interfere with the links.

The site survey should include an RF scan to identify available frequencies. Check the preferred frequency at all locations; a frequency that's clear at one location may be crowded at another. Frequency planning is a critical factor in planning and implementing a wireless mesh network.

The site survey process should be ongoing. To verify that a site is relatively free of interference, site audits should occur every 6 to 12 months, scheduling regular maintenance visits to coincide with the site audits.

Cabling the SkyAccess DualBand

Ethernet cabling provides both power and data connectivity for the SkyAccess DualBand.

The section provides instructions for attaching CAT5 cable to the device.

1 Terminate the appropriate grade and length of CAT5 cable with an RJ-45 connector and plug it into the RJ-45 port on the back of the SkyAccess DualBand.

Figure 3. Connecting CAT5 cable to the SkyAccess DualBand

5 GHz

2.4 GHz
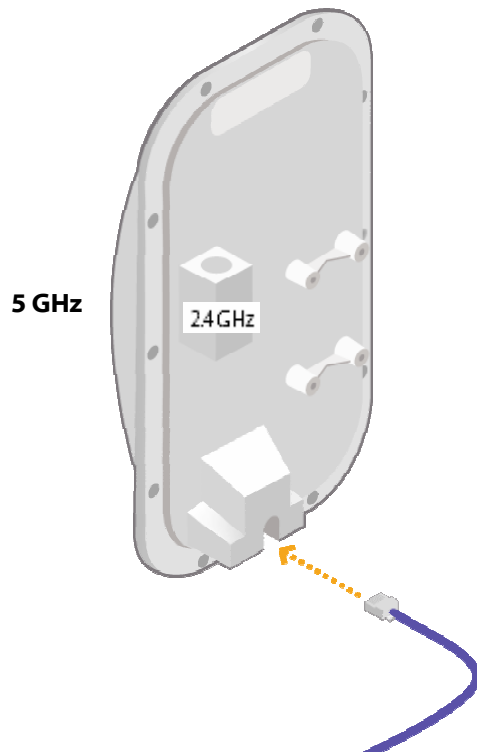
Make sure the fit is snug so that the cable does not interfere with the weather gasket.

2   Insert the weather gasket and secure the metal cover.

Press the CAT5 cable into the gasket and insert the gasket into the housing, taking care not to twist or place unnecessary force on the RJ-45 connector.
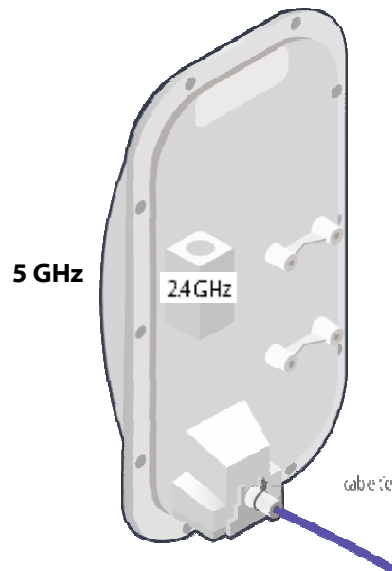
Fit the metal cover over the weather gasket and secure it with the four machine screws supplied in the accessory kit.

Figure 4. Attaching weather gasket and metal cover

5 GHz

2.4 GHz

weather
gasket

metal
cover
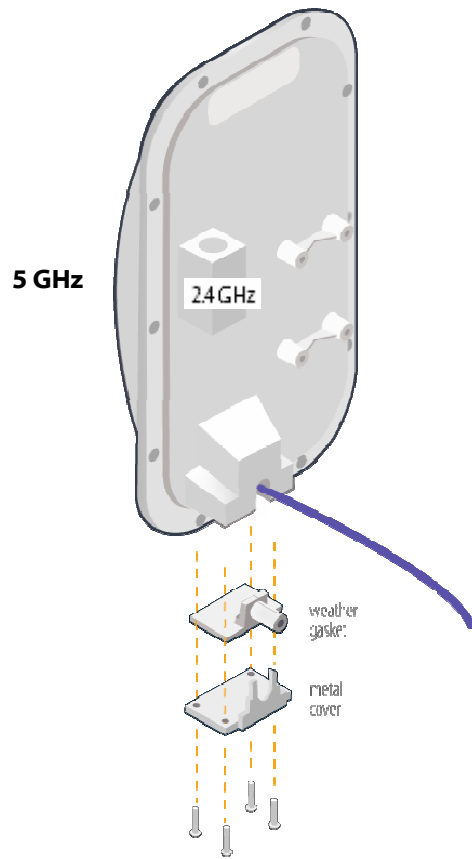
4   Attach tie wraps to the neck of the weather gasket and tighten them so that they slightly depress the neck.

Figure 5. Attaching tie wraps to the gasket neck

The tie wraps provide relief from cable strain and ensure a fully weatherproof seal.

Powering on the SkyAccess DualBand

Prior to mounting the SkyAccess DualBand, power on the unit to use the onboard LEDs to facilitate optimal placement.

1   Connect the SkyAccess DualBand to the power supply, as follows:

   a. Plug the AC adapter into an AC outlet.

   b. Connect the Ethernet cable to the port labeled "CPE" on the power injector.

   c. Plug the AC adapter into the power injector.

Figure 6. Providing power to the SkyAccess DualBand
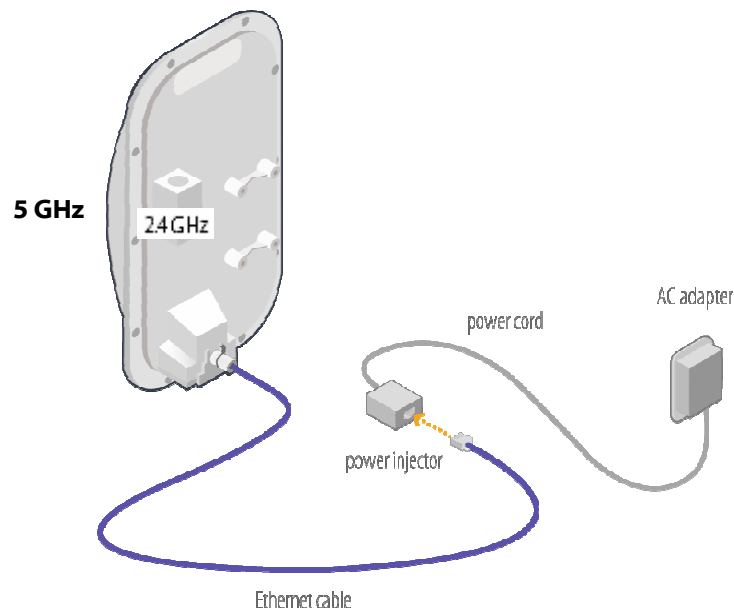
2 Check the LEDs on the SkyAccess DualBand.

If the connections are correct, the power LED (labeled "PWR") and the WAN activity LED (labeled "WAN Act") on the SkyAccess DualBand will illuminate. The WAN Act LED should blink and turn off, but the PWR LED should remain lit.

Figure 7. Checking the SkyAccess DualBand LEDs