



# SkyExtender Plus

## Point-to-Multipoint Base Station with Integrated Backhaul and Multi-Hop Relay

The SkyExtender™ Plus is a broadband wireless device that integrates a point-to-multipoint base station with point-to-point backhaul and multi-hop relay capabilities into a single cost-effective system. With integrated backhaul and multi-hop relay capabilities, the SkyExtender Plus expands the broadband wireless network from a centralized SkyGateway by creating a flexible and robust mesh topology that offers carrier-class reliability through dynamic best-path routing, self-healing failover, and adaptive modulation. The SkyExtender Plus includes an advanced antenna array that dynamically and synchronously switches between eight high-gain antenna sectors. Each SkyExtender communicates using OFDM over a dynamically-switched point-to-point link with an EIRP as high as 63 W to deliver high modulation rates and the ability to support links as long as 10 miles/16 km. Intelligent SyncMesh™ technology manages traffic across the mesh backhaul to mitigate interference and support the prioritizing of voice and data for Quality of Service.

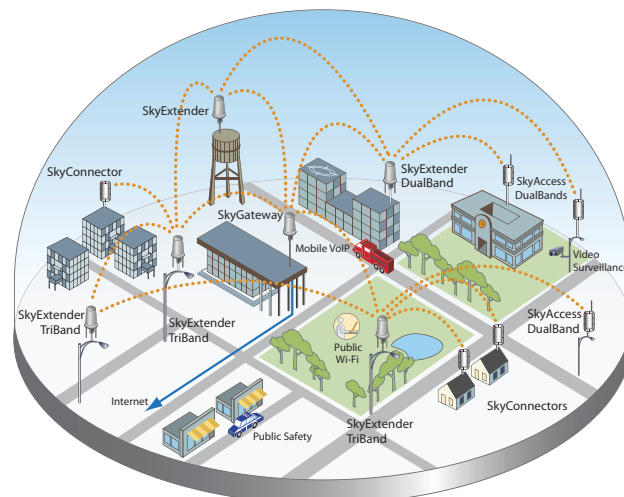
The SkyExtender Plus also has DualBand and TriBand models that integrate Wi-Fi access points at 2.4 GHz for public access and/or 4.9 GHz for mobile public safety communications. Each access point includes a high power radio with a high-gain omnidirectional antenna. With SkyExtender DualBand and TriBand nodes, service providers and municipalities can provide ubiquitous coverage area for both public usage and mobile first responders communications while seamlessly managing traffic across the SkyPilot wireless backhaul network.

The SkyExtender Plus has all of the same features as the standard SkyExtender but with a few specific hardware enhancements designed to help performance in harsh outdoor environments:

- **Enhanced GPS receiver** improves GPS signal reception sensitivity by 10 dB, resulting in a stronger and more reliable GPS signal.
- **Higher transmit power** helps consistently establish high modulation links even over long distances. With an additional 3 dB gain, the SkyExtender Plus increases peak transmit power to 30 dBm.
- **Improved antenna isolation** enhances external- and self-interference mitigation by providing up to 40 dB of adjacent sector isolation, which limits the effect of unwanted signals on adjacent sectors from impacting the reception of the intended signal on the sector in use.
- **Improved surge suppression** provides 100 amps of lightning protection.

## Benefits

- **Flexible Architecture** – automatically and dynamically switches between point-to-multipoint, point-to-point, and multi-hop relay
- **SyncMesh** – intelligence manages traffic and RF performance to optimize available bandwidth
- **Lower OpEx** – through autodiscovery and self-configuration, dynamic rerouting, and self-healing advantages of mesh
- **Dual and TriBand Options** – to support client services
  - 2.4 GHz for standards-based Wi-Fi HotZones
  - 4.9 GHz for licensed public safety agencies
- **End-to-end QoS** – to support converged voice, data and video
- **Multiuse Network** – ready for citywide municipal and service provider deployments
  - Fixed 'last-mile' broadband Internet services
  - Public Wi-Fi access
  - Public safety and first responder communications
  - Mobile connectivity for remote agency staff
  - AMR and other e-government initiatives



*The SkyExtender Plus expands the wireless network to create a resilient, multi-hop mesh topology serving multiple broadband wireless applications*

# SkyExtender Plus Specifications



## Traffic Management

- VLAN Support: IEEE 802.1q
- Traffic Prioritization: IEEE 802.1p, protocol type, IP port, IP ToS field, and IP address list
- Traffic Filtering: protocol type, IP port, and IP address list
- Traffic Shaping: upstream and downstream per-user rate control

## Configuration, Management, & Monitoring

- EMS: SkyControl™
- NMS Integration: SNMPv2c
- IP Address: DHCP or static
- Firmware: Multiple versions stored in nonvolatile memory; updated over the air via FTP
- Provisioning: Manual or automated
- Configuration File: XML over HTTP
- SNMP MIBs: MIB-II (RFC 1213); EtherLike (RFC 2665); Bridge (RFC 1493); 802.11; SkyPilot private MIB
- Remote logging
- Remote Management: CLI via Telnet, SNMPv2c, web browser
- Local Management: RS-232 serial console port

Models	SkyExtender Plus	SkyExtender Plus/DualBand	SkyExtender Plus/TriBand
Mesh Backhaul	4.940-6.075 GHz	4.940-6.075 GHz (see below)	4.940-6.075 GHz (see below)
Local Access	10/100 Mbps Ethernet (PoE)	10/100 Mbps Ethernet (PoE)	10/100 Mbps Ethernet (PoE)
Wi-Fi Access	None	802.11b/g (2.4 GHz) or 802.11a (4.9 GHz)	802.11b/g (2.4 GHz) and 802.11a (4.9 GHz)

## Wi-Fi Access Specifications

Access Point	2.4 GHz	4.9 GHz
Frequency Band	2.400-2.483 GHz	4.940-4.990 GHz
Radio (peak Tx)	400 mW / 26 dBm	400 mW / 26 dBm
Antennas	7.4 dBi omni	9.5 dBi omni
EIRP	2.2 W / 33.4 dBm (maximum) 100 mW / 20 dBm (minimum)	3.5 W / 35.5 dBm
Media Access	IEEE 802.11b/g CSMA/CA	IEEE 802.11a CSMA/CA
Modulation	OFDM (802.11g), DSSS (802.11b)	OFDM (802.11a)
Channel Width	20 MHz	5, 10, or 20 MHz
Receive Sensitivity	-98 dBm at 1 Mbps	-94 dBm at 6 Mbps (4.9 GHz)
Authentication	RADIUS support, 802.1x	
Encryption	AES, WPA (EAP-TTLS, EAP-PEAP/MSCHAPv2 with TKIP), MIC, and dynamic WEP	

## Mesh Backhaul Specifications

Frequency Band	4.940-5.350 (not available with 4.9 GHz AP), 5.470-5.725, or 5.725-6.075 GHz
Radio (peak Tx)	30 dBm / 1 W
Antennas	Eight integrated antenna sectors Each sector: 18 dBi (45° azimuth, 6° elevation)
EIRP	48 dBm / 63 W peak (maximum) (also available in configurations for 36 dBm / 4 W, 33 dBm / 2 W, and 30 dBm / 1 W for international regulatory compliance)
Media Access	Time Division Duplex (TDD)
Modulation	OFDM with adaptive modulation
Throughput	Up to 20 Mbps UDP / Up to 12 Mbps TCP
Receive Sensitivity	-90 dBm at 6 Mbps
Channel Width	20 MHz
Channel Resolution	5 MHz frequency control
Range	Up to 10 miles/16 Kilometers
Latency	8-10 ms roundtrip per hop
Connectivity	SkyGateway Series and SkyExtender Series, SkyAccess and SkyConnector devices
Authentication	RSA-Based Certificates
Encryption	128-bit AES

## Physical Specifications

Connections	One RJ-45 – power and Ethernet (PoE) One RJ-45 – RS-232 serial for local CLI
Mounting	Mast, tower, utility pole, light pole, building or other infrastructure (optional mounting kits available for some installations)
Indicators (LED)	Wireless activity, wireless link (located on device bottom for easier ground level viewing)
Dimensions	Height (without Wi-Fi antennas): 25 inches / 63.5 cm Height (with Wi-Fi antennas): 33 inches / 83.8 cm Width/Depth: 12 inches / 30.5 cm
Weight	15.0 pounds / 6.75 Kilograms
Operating Temperature	-40° to 131° F / -40° to 55° C
Wind Loading	Up to 150 mph / 242 kph
Enclosure	NEMA-4X
Power	110 VAC, 50-60Hz input; 8.5-16 Watts (varies by model and other factors)
Certifications	FCC Part 15, FCC 47 CFR Part 15, Class B USA; compliant with UL safety standards; ETSI; ACA: RoHS
EMI	FCC Part 15.107 and 15.109



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