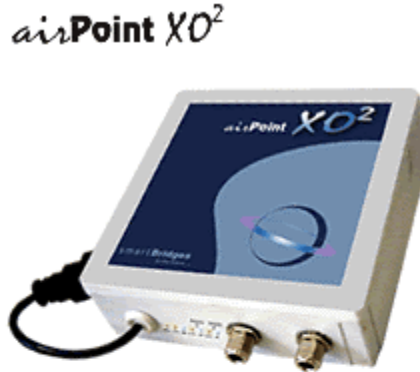# airPoint XO^2

airPoint XO^2 is a dual-radio access point that offers all the features of the airPoint XO including Bandwidth Management, Advanced Networking and Carrier Class Features. In addition, modular control of the two radios enables many different configurations. The airPoint XO^2 can be used in high performance Cell Extender configuration for deploying low cost backhaul solution. It can be used as two Access Points in a box for simultaneous use to support large number of users or it can also be used as a highly reliable Access Point with Hot Standby for redundancy. The dual-radio design eliminates/minimizes throughput loss that would typically occur in these configurations when operating with a single radio. The multimode functionality offered by airPoint XO^2 is unrivalled and simplifies the deployment of Wireless Wide Area Networks.

Bandwidth Management	Advanced Networking	Carrier Class Reliability	High Performance Dual Radio Configurations
• Bandwidth Management for high QoS • Built-in RADIUS client for authentication and individual user SLA • Independent upload/ download control for each user • Internal MAC table list for small networks • Supports more clients per Access Point	• Roaming support by external RADIUS control • Seamless operation in PPPoE networks • SNMP Access to MAC forwarding tables • Access control list and IP filters for SNMP requests • Advanced traffic statistics	• Powered by IEEE 802.3af compliant PoE Outdoor • Surge suppression • Regulatory compliant installations • Weatherproof, rugged thermal design in NEMA4X enclosure • Device Temperature monitoring by SNMP • Dedicated Network Processor for secure device management	• Wireless Repeater mode for high performance backhaul • Client Bridge mode to provide Cell Extender functionality • Dual Access Point mode for increased coverage • Access Point with standby redundancy • Additional Network Processor for sustained high performance

The flexibility of configurations that can be achieved with the airPoint XO^2 is quite unique and radically simplifies installations. These configurations (modes) make it possible to design and deploy efficient, high-performance wireless networks effortlessly and profitably.
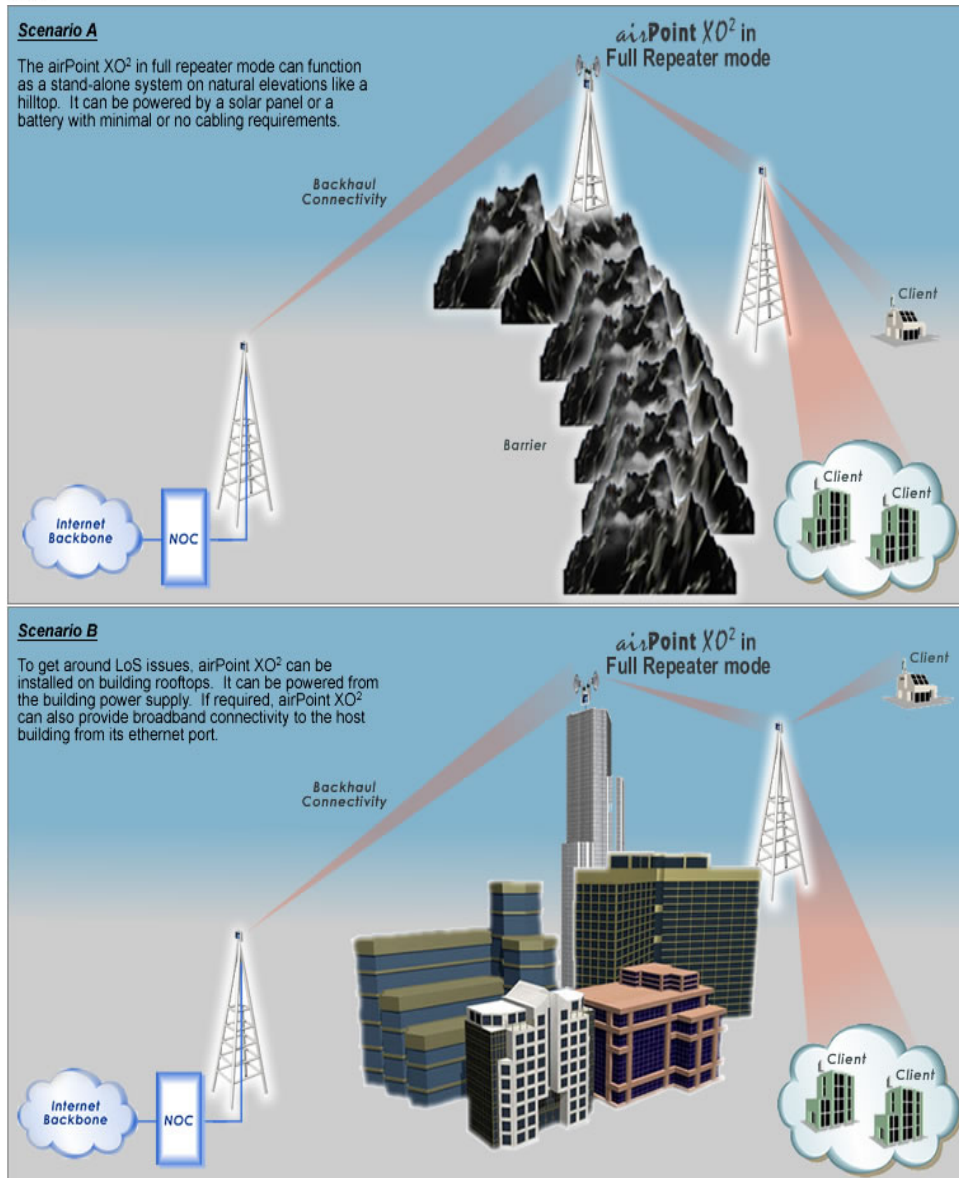
Full Repeater mode, with Bandwidth Management
This mode is particularly useful to WISPs for covering very long distances without incurring throughput loss. In a typical scenario, if signals have to be repeated, the throughput is generally halved by the repeater. airPointXO[2]'s Full Repeater mode overcomes the problems of lowered throughput and higher costs by configuring both back to back connected radios as repeaters.

- Eradicates throughput loss for repeaters
- Doubles signal relay distance

airPoint XO² in Full Repeater mode

The two radios in airPointXO² can be configured as repeaters and connected back to back. One of the radios associates with the NOC while the other connects to a distant Access Point. This mode is particularly useful to WISPs for covering very long distances without incurring throughput loss. airPointXO²'s Full Repeater mode overcomes the problems of lowered throughput and higher costs.
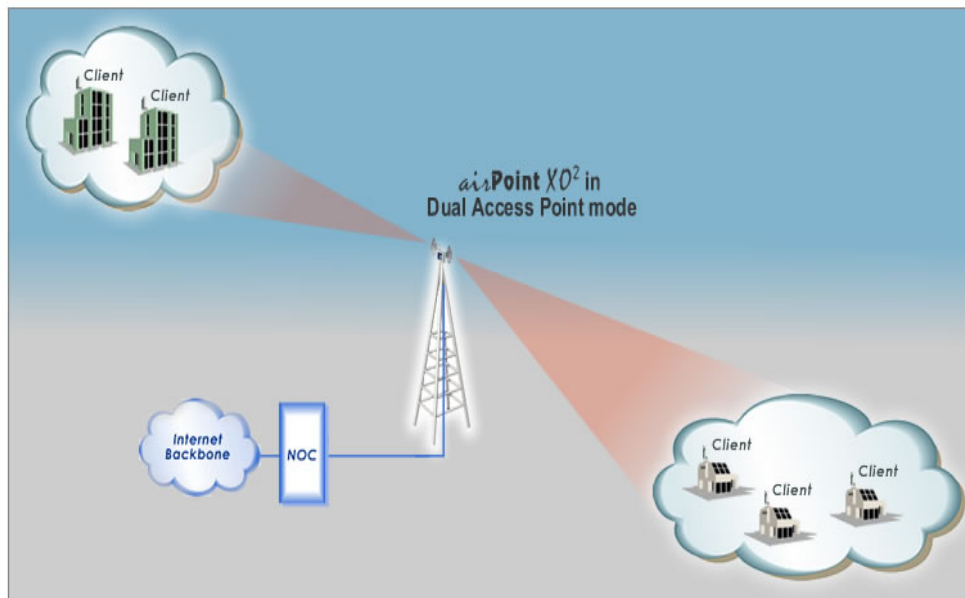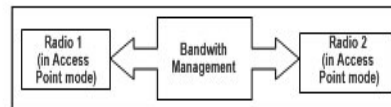
Scenario A

The airPoint XO² in full repeater mode can function as a stand-alone system on natural elevations like a hilltop. It can be powered by a solar panel or a battery with minimal or no cabling requirements.

Scenario B

To get around LoS issues, airPoint XO² can be installed on building rooftops. It can be powered from the building power supply. If required, airPoint XO² can also provide broadband connectivity to the host building from its ethernet port.

Dual Access Point mode, with Bandwidth Management
Using airPoint XO^2 a WISP can configure both the radios to access point mode in order to cover a larger geographical area. The Bandwidth management feature optimizes bandwidth utilization for each access point's client group, as well as manages bandwidth allocation between the two radios.

- Enhances geographical coverage from a single device
- Reduces number of required installations lowering infrastructure costs

airPoint XO^2 in Dual Access Point mode

The two radios in airPoint XO^2 can both be configured to access point mode. The Bandwidth management feature optimizes bandwidth utilization for each access point's client group, as well as manages bandwidth allocation between the two radios. Together, these two access points can cover a much larger geographical area. Two access points housed in one single box also means reduced number of network installations which lowers infrastructure costs.
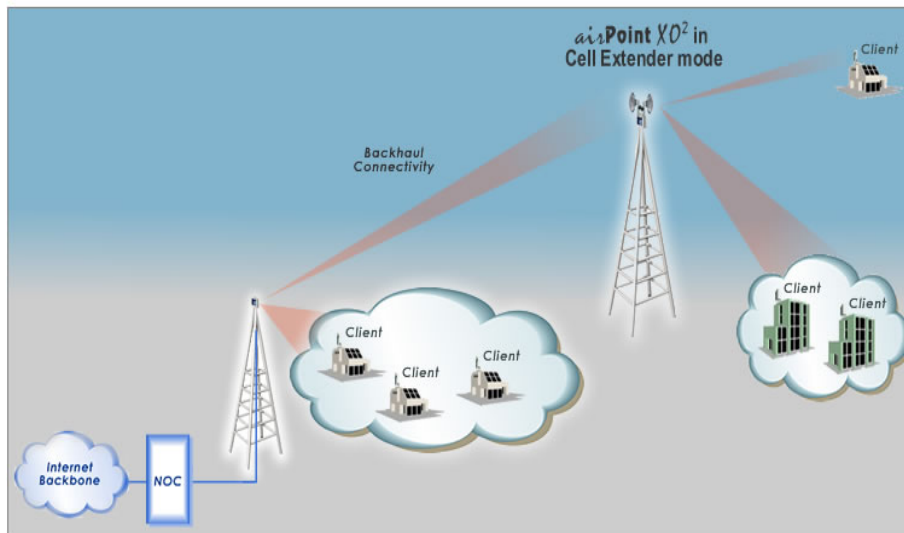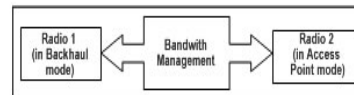
Cell Extender mode, with Bandwidth Management
airPoint XO^2's dual radio system can be operated with one radio configured for dedicated backhaul connection to the NOC and the other radio configured as an access point.

  - Faster speeds, better throughput

  - Bandwidth management at PoP

  - Reduced processing overheads, protocol conversion overheads etc

High Reliability Access Point mode, with Standby Redundancy
airPoint XO^2 is built to reinforce service reliability in outdoor wireless networks so as to enhance user satisfaction. WISPs can configure one of the radios to access point mode to provide broadband coverage to a designated area. The second radio can be configured as a hot standby for this access point.

  - Enhanced network reliability and uptime
  - Built in redundancy in the network

Bandwidth Management for increased ROI
The airPoint XO^2 provides bandwidth throttling of upload/download streams. The bandwidth control can be done using static tables or dynamically by RADIUS, along with authentication. The Wireless ISP can profile subscribers based on speed limits and identify bandwidth usage patterns. This opens up customer segmentation possibilities, leading to revenue maximization.

The airPoint XO^2 provides traffic statistics. This helps the WISP to observe the behavior of network devices, traffic load fluctuations and other events, making it much easier to troubleshoot any problems, which might occur. The information available helps the WISP to optimize bandwidth utilization. WISPs can now easily provide services to more subscribers

Easy Scalability & Roaming
By distributing the bandwidth management function from the centralized NOC out to individual airPoint XO^2 access points, it is now possible to design scalable wide area networks. Bandwidth traffic policies can be set remotely from a central NOC. This avoids the need for backhauling all the data traffic to a single place, thus

averting a choke point. All access points in the network controlled by one NOC not only brings convenience to network management but also enables mobile users to avail easy roaming facility Roaming users can cross over seamlessly from one cell to another within the same WISP network, without the need for authentication at every cross-over.

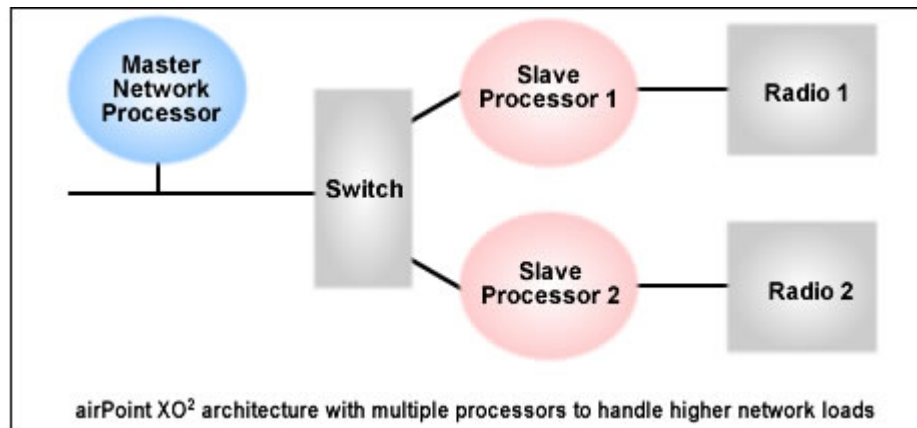**Remote Management, Upgrades and Control**
airPoint XO^2 has built-in features to make device management both convenient and secure. It can provide access control lists and filters for SNMP traffic, as well as IP filtering. The airPoint XO^2 supports remote setting of radio parameters, firmware upgrade and restore defaults through SNMP. Further, the WISP can also monitor the temperature of the unit through the thermal sensing facility, which is policy based. The product supports SNMP based remote monitoring and management through simple NMS and simpleMonitor and has an embedded SNMP MIB.

Long Range™ Radio Performance and Flexible Antenna Options
airPoint XO^2 features LongRange™ wireless radio that delivers high data throughput over long operating range. With a suitable antenna airPoint XO^2's range easily extends to 34 kilometers (21 Miles). The airPoint XO^2 has been FCC certified with many antenna configurations normally used by WISPs and outdoor wireless installers. Software controlled "Dial-a-Power" lets the installer control radio power output. Together, these features provide the much-needed flexibility to choose the right antenna with the pattern and gain characteristics conforming to local regulatory limits as well as coverage area requirements. The airPoint XO^2 supports 128 clients per radio.

Reinforced Processing Capability for higher network loads
airPoint XO^2, with more raw processing power, surpasses other available devices allowing it to take on bigger network loads. The two radios with their individual slave processors coupled with the master processor of the unit can support enormous network loads. This makes the network robust enough to withstand load spikes thereby ensuring infrastructure reliability.
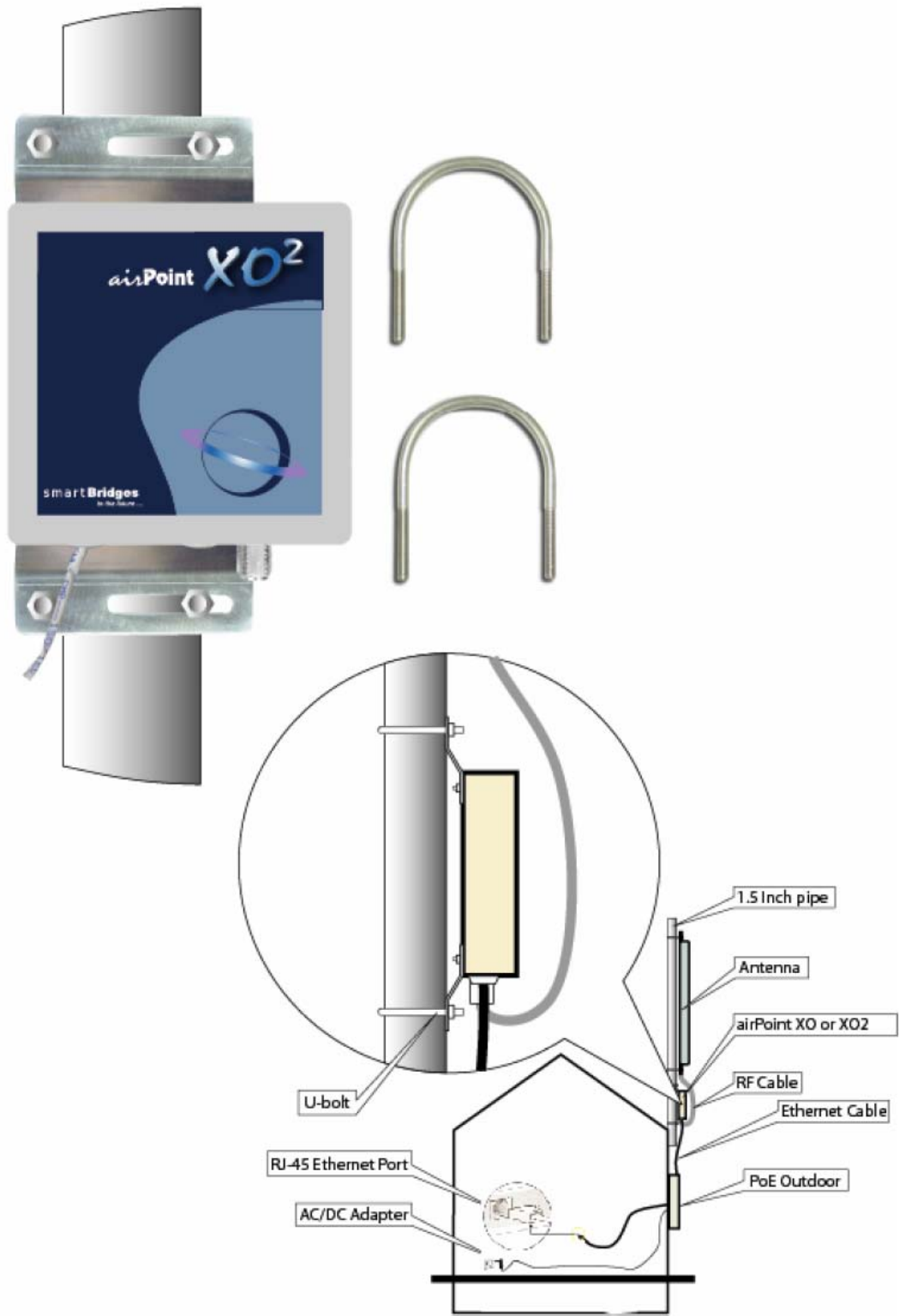

airPoint XO^2 architecture with multiple processors to handle higher network loads

Carrier Class Reliability
Housed in a NEMA 4X weatherproof casing, and using industrial grade components, the airPoint XO^2 is built to perform reliably under all climatic conditions, withstanding temperatures anywhere between -40 C and +60 C (-40 F to 140 F).   The device has built-in sanity timers for automatic reset at periodic interval. Power to the radio can be remotely controlled. These housekeeping resets means very robust and self-healing Wide Area Networks. The product has heavy duty/built-in Gas Discharge Tube for surge suppression capability. Used along with the PoE Outdoor (standard accessory), the airPoint XO^2 is an extremely robust outdoor device for WISPs. The airPoint XO^2 complies with CE and FCC standards for wireless installations.

Protection

Please refer to the following diagram.

From the diagram we can see that the airPoint XO™ series is connected to the PoE Outdoor™ that complies with the IEEE 802.3af via RJ45 cable for the voltage supply. The airPoint XO™ series when used with PoE Outdoor has reliable surge suppression capability. RJ45 data lines are clamped to 7.5V and the Transient Voltage Suppressor (TVS) provides protection against High Voltage transients. Grounding is achieved through the grounding stud at the bottom of airPoint XO™ series enclosure box. The stud should be connected to the ground to achieve proper grounding system. The Gas Discharge Tube (GDT) is also provided to handle large surges. The airPoint XO™ devices, used along with the PoE Outdoor™, are extremely robust outdoor devices for WISPs. The airPoint XO™ series complies with CE and FCC standards for wireless installations.