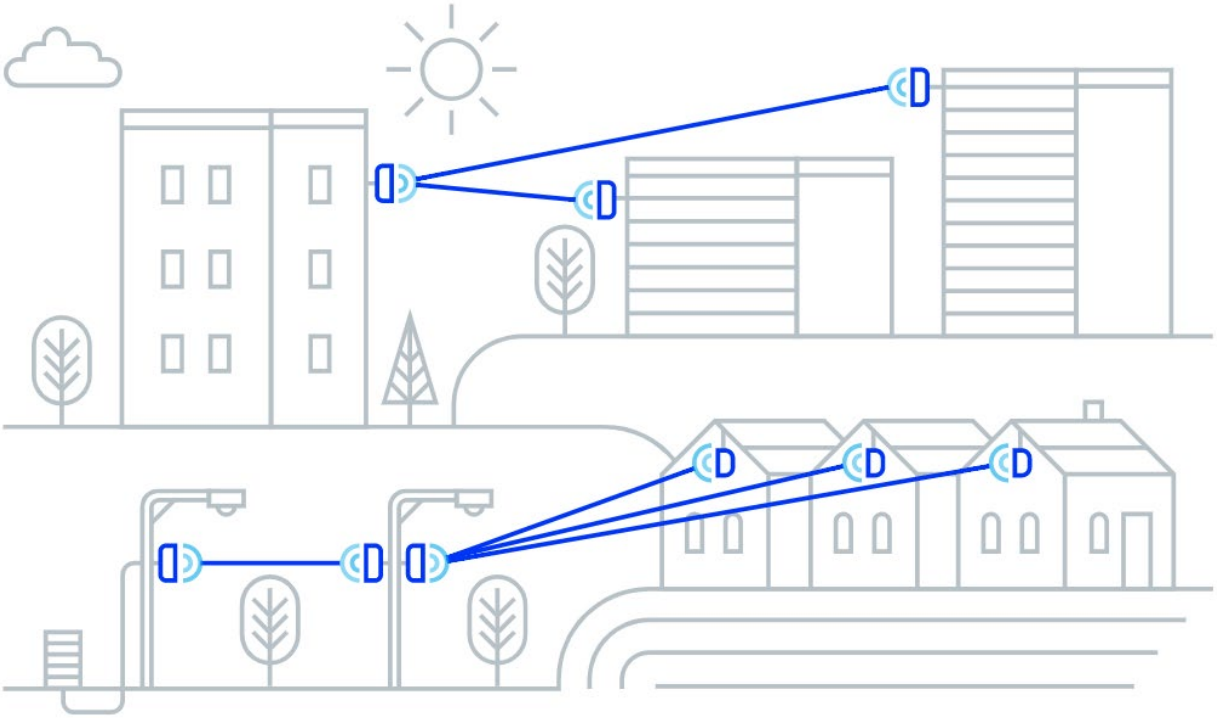

Architectural and Engineering Specification
AltoReach

October 17, 2025

1. Summary

A. The intent of this document is to specify the minimum criteria for the design, supply, and installation of AltoReach long-range 60GHz wireless radios.

B. Product: V band long-range radio that provides wireless point-to-point and point-to-multipoint connectivity based on the 802.11ad standard, with 2.5GbE Ethernet support.

C. AltoReach radios provide carrier-grade network connectivity for Ethernet applications such as high-definition megapixel cameras, multi-sensor cameras, and network video recorders (NVRs), as well as extending networks at fiber-quality speeds to provide Wi-Fi backhaul, smart city municipal building-top and street-level implementations, and connecting law enforcement locations.

D. Related requirements:

- Features and functionality
  - Operation
  - Connectivity
  - Security
  - System management
- Device Power
- Device dimensions
- Physical installation
- Enclosure
- Certifications

2. Specification

A. The AltoReach AP90 and S150 radios shall include the following features and functionality:
   1. The AP90 and S150 shall be able to function as an Access Point or Station.
      a) When functioning in Access Point mode, the AltoReach radio shall support up to 32 connected Stations.
   2. The AP90 shall provide 90° horizontal and +/-20° vertical coverage.
   3. The S150 shall provide 4° horizontal and vertical coverage.
   4. The AP90 and S150 shall operate in the unlicensed 57-71GHz band.
      a) The AP90 and S150 shall provide 6 non-overlapping 2.16GHz channels within the 57-71GHz band.
         i. Half-channel setting allows for 12 non-overlapping 1GHz channels.
      b) Channel access shall be TDD.
   5. The AP90 and S150 shall have 12 levels of Modulation and Coding Schemes from MCS-0 (BPSK) to MCS-12 (16QAM).
      a) Half-channel setting has a maximum MCS of 9.
   6. The AP90 and S150 shall have a capacity of up to 2+Gbps aggregate.
   7. Ethernet port:
      a) The AP90 and S150 shall have 1 RJ-45 2.5G BASE-T Ethernet port (with auto-negotiation speeds of 1Gbps/100Mbps).
      b) The AP90 and S150 shall have IP67-rated ingress protection.
      c) The Ethernet port shall be used to provide power to the device by using 802.3at Power over Ethernet (PoE).
   8. The AP90 and S150 shall have transparent Ethernet bridging types including VLAN.
   9. The AP90 and S150 shall utilize hardware-based AES-128 encryption for the 60GHz radio.
   10. The AP90 and S150 shall have an operating temperature range of -40° to +131°F (-40°C to +55°C).

B. System Management:
   1. The AP90 and S150 shall provide a WebUI accessed from a desktop browser for configuration, management, and monitoring.
      a) The AP90 and S150 shall also be optionally supported with AltoCommand, Altowav's enterprise management and monitoring UI.
      b) The AP90 and S150 shall be able to be operated without AltoCommand.
   2. The AP90 and S150 shall support the HTTPS protocol.
   3. The AP90 and S150 shall provide a REST API for management and monitoring.
   4. The AP90 and S150 shall provide the ability to save the unit configuration and upload it from local and remote connection.
   5. The AP90 and S150 shall provide the ability to update configuration over the network (in-band).
   6. The AP90 and S150 shall provide the ability to upgrade software over the network (in-band).

7. The AP90 and S150 shall default to using a static IP address.
    a) The AP90 and S150 shall be able to be configured to use dynamic IP address assignment (DHCP).
8. The AP90 and S150 shall have an LED light to indicate device status.
    a) The LED shall provide visual indication of the status of the device, including:
        i. When the device is powering up.
        ii. When the device is waiting to form wireless connections.
        iii. When the device has formed wireless connections.
    b) The AP90 and S150 shall also have Ethernet port LED lights, indicating power and link status.

C. Power:
1. The AP90 and S150 shall support Power over Ethernet (PoE) input.
2. The AP90 and S150 shall have a 25W maximum power consumption.

D. Dimensions:
1. The AP90 and S150 shall be 5 x 5 x 2 inches (130 x 130 x 55mm).
    a) The S150 included antenna kit shall be 7 x 6 x 3 inches (300 x 300 x 80 mm).
2. The AP90 and S150 shall weigh 15 oz (425g).
    a) The S150 included antenna kit shall be 34 oz (964g).

E. Physical installation
1. The AP90 and S150 shall provide an IP67-rated cable gland for installation of an Ethernet cable.
2. The AP90 and S150 shall provide wall-mounting and pole-mounting options without requiring additional brackets.
    a) The AP90 and S150 shall have an optional pole mount bracket.
        i. The pole mount bracket shall be attached to the pole by using band clamps.
        ii. The wall mount bracket shall enable azimuth adjustment.

F. Enclosure
1. Mechanical installation of the AP90 and S150 shall not require special tools.
2. The AP90 and S150 enclosure shall include all necessary link components:
    a) Baseband.
    b) Radio.
    c) Scanning antenna.
        i. The S150 shall include a provided external antenna kit.
3. The enclosure shall include the ability to be grounded.

G. The AP90 and S150 shall include the following certifications:
1. FCC ID: Z9W-TNA-303X
2. IC: 1468A-TNA303X