

# Performance Optimization Guide

## Doodle Labs Performance Optimization Guide: Drone at 10 km

We've developed our Doodle Labs Performance Optimization Guides to shed light on how specific Doodle Labs customers are achieving peak performance at particular ranges and use-cases.

The following configuration data was provided by a Doodle Labs customer based on results achieved during real field testing. As with the use of any radio technology, unique environmental challenges may require alternative configurations to achieve similar results.

### Drone Description:

This drone was developed for the DoD and is meant to be launched organically by a single solider. It fits into a rucksack and supports integrations with sensors, payloads and other technologies. The UAS is used for an array of missions, including signals intelligence, targeting and identification, direct effects and the delivery of supplies.



### Link Details

- **Type of System used in test:** Multi-Rotor
- **Range:** 10 km confirmed

- **Type of data and throughput at 10 km:** 2-6 Mbps
- **Number of Nodes:** 2-4

### Doodle Labs Product Details

- **Mesh Rider Radio Models:** RM-2025-2xxxx
- **Frequency Band:** Helix M1-M6
- **Channel Width:** Variable, 5-20 Mhz depending upon operating profile selected
- **Level of encryption:** AES -128/256

### Mesh Rider Settings (if different from default)

- **DiffServ:** Enabled
- **Transmit Power Control:** Enabled
- **Mesh Map:** Disabled
- **Multicast Optimizations:** Enabled
- **Types of Traffic:** Multicast

### Antenna Details

- **Antenna Gain - GCS:** MP Helix Stock Antennas 2-3 dBi
- **Antenna Type - GCS:** Omni
- **Antenna Polarization - GCS:** Multi
- **Antenna Height:** In operator's hands; UAV up to 400 ft
- **Antenna Gain - UAV:** MP Helix Stock Antennas 2-3 dBi
- **Antenna Type - UAV:** Omni
- **Antenna Polarization - UAV:** Multi
- **Tx Power:** Auto or Max

### Integration/Customer System Specifics

- **Operational State Footprint:** 65" x 64" x 15"
- **Weight:** 19 lbs
- **Flight controller:** Pixhawk
- **GCS Software:** QGround Control
- **SBC/Encoder:** Modal AI VOXL
- **Onboard camera / sensor:** Vauxhall FPV Camera 4K

## Environment

- **Location (urban, remote, etc):** Gov and USA(FCC)
- **Potential obstructions to signal path:** Mountains used for testing relays. Flying around buildings. Deliberate jamming from hostiles.