

GPS2Quantum™ – Mobile User Guide

This guide explains how to use the GPS2Quantum mobile app to simulate GPS outages, configure drift time, and interpret uncertainty visualizations using quantum-grade positioning.

1. Core Simulation Parameters

Parameter	Description
Sensor Type	Choose from Strategic, Navigation, Tactical, or Consumer Grade. Affects drift performance.
Operational Condition	Environment in which the device operates (Static, Automotive, Aerial, Subsea).
Drift Time (Δt)	Time since last GNSS fix (in seconds).
Drift Rate	Auto-calculated from Sensor + Condition. Used in: $\text{radius} = \text{drift_rate} \times \Delta t$.

2. Quantum Drift Matrix (m/s)

Sensor Class	Static/Lab	Automotive/Urban	Aerial	Subsea
Consumer Grade (MEMS)	0.1	0.5	1.0	0.8
Tactical Grade	0.05	0.1	0.3	0.2
Navigation Grade	0.01	0.05	0.1	0.08
Strategic Grade (Quantum)	0.001	0.01	0.03	0.005

3. Typical GPS Outage Scenarios

Use the app’s Search Location and Settings screen to simulate GNSS signal loss based on the following templates.

Scenario	Recommended Settings	What to Expect
Urban Canyon	Sensor: Tactical Grade Condition: Automotive Drift Time: 30–120 sec	Moderate drift (3–12m) due to temporary signal block in city environments.
Tunnel / Subsurface	Sensor: Strategic Grade Condition: Static Drift Time: 300+ sec	Very low drift (<1m) even after several minutes, simulating tunnel blackout.
Airborne / Drone Loss	Sensor: Strategic Grade Condition: Aerial Drift Time: 15–45 sec	Short GPS loss in flight. Expect 0.5–1.5m uncertainty.

Jamming / Denial Zone	Sensor: Tactical Grade Condition: Automotive Drift Time: Custom	Flexible modeling of deliberate GNSS denial. Uncertainty depends on drift time.
Deep Sea / Submarine	Sensor: Strategic Grade Condition: Subsea Drift Time: 600 sec	Long-duration underwater loss. Quantum drift remains under ~3m.

4. Drift Equation

The quantum uncertainty radius is computed as:

$$\text{radius} = \text{drift_rate} \times \text{drift_time}$$

5. Best Practices

Use **Search Location** to input coordinates manually and simulate GPS loss. Use the **Settings** screen to configure sensor, condition, and drift time. Tap **Results** to see converted coordinates and estimated uncertainty. Tap **Earth Sphere** to visualize physical drift. Tap **Bloch Sphere** to view directional or phase-related output.