LOKO

GPS Tracking System — User Manual

nolilab.com/loko-config-tool/

OVERVIEW

Loko is a compact GPS tracker for drones. Two units work together: Loko Air (airborne) acquires GPS and transmits via LoRa radio; Loko Ground (base) receives data and forwards it to the Loko mobile app over Bluetooth.

loko-air	loko-ground
GPS + LoRa transmitter, mounts on aircraft Li-ion 200 mAh | 15 g | up to 1 yr	LoRa receiver + Bluetooth relay, stays on ground 18650 Li-ion (user-supplied, not included)

SPECIFICATIONS

parameter	value
radio	LoRa / CHIRP — penetrates buildings, urban clutter, dense forest
frequency	868 – 920 MHz (configurable)
tx_power	8 dBm default (configurable)
gnss	GPS + GLONASS + Galileo
range	+20 km line-of-sight at 2 m AGL; grows with altitude
battery_life	up to 1 year (depends on wake interval)
weight	15 g (Air unit)
charge	5V USB Type-C only
temperature	0 °C – 40 °C operating
calculator	nolilab.com/pages/specs

HOW IT WORKS

Each wake cycle: Air unit wakes → acquires GPS fix → transmits to Ground unit → sleeps until next cycle. If no satellite fix is available, last known coordinates are transmitted. GPS track log is written to internal flash and can be downloaded via USB.

Multiple Air units can pair to a single Ground unit simultaneously.

PART 1 — CONFIGURE LOKO AIR

No software to install. Use the web configurator in a Chromium-based browser (Chrome, Edge). Firefox and Safari are not supported — no Web Serial API.

1.1 Open configurator

1. Open Chrome or Edge.
2. Go to: nolilab.com/loko-config-tool/

NOTE Four tabs: Configuration — set device parameters. GNSS Trace — read GPS log from Air unit, visualise on map, export .gpx / .csv. Ground Unit — configure Ground unit. Firmware Update — flash latest firmware to Air unit.

1.2 Connect

3. Connect Loko Air to the computer via USB Type-C.
4. Click Connect on the Configuration tab.
5. Grant browser serial access when prompted → select the correct port.

NOTE If the port does not appear, flip the Type-C cable — pin orientation matters.

1.3 Set parameters → Save Changes

parameter	description
transmit_mode	P2P for direct Air↔Ground (standard). LoRaWAN for network-server integrations.
frequency	868–920 MHz. Must match Ground unit exactly.
id1	2-digit pairing code. Must match on both Air and Ground units.
id2	2-digit Ground unit identifier. Must match Ground unit setting.
wake_up_period	How often the Air unit wakes. Units: s / min / h. Shorter = faster battery drain.
send_mult	Transmit on every Nth wake cycle (1 = every cycle, 0 = disable).
save_mult	Log GNSS trace every Nth wake cycle (0 = disable logging).
gnss_mode	Movement profile: Normal | Fitness | Aviation | Balloon | Stationary. Default: Normal. Use Aviation or Balloon for drones.
tx_power	Radio output in dBm. Higher = more range, more battery drain. Default: 8 dBm.
p2p_encryption	Optional. 64-char HEX key (32 bytes) for AES-256. Must match Ground unit if enabled.

1.4 Power on

6. Disconnect USB.
7. Hold power button until LED blinks red → unit is active.

NOTE Solid red LED = sleep mode between transmissions. Normal behaviour.

PART 2 — CONFIGURE LOKO GROUND

No built-in battery. Unscrew the four rear fasteners, insert an 18650 Li-ion cell, reassemble.

2.1 Open configurator → Ground Unit tab

8. Go to: nolilab.com/loko-config-tool/ in Chrome or Edge.
9. Click the Ground Unit tab.

2.2 Connect

10. Connect Loko Ground to the computer via USB.
11. Click Connect → grant serial access → select port.

2.3 Read → update → Send

12. Click Read to load current settings.
13. Set the parameters below to match the Air unit configuration.
14. Click Send, then disconnect USB.

parameter	description
id2	2-digit identifier. Must match id2 set on the Air unit.
frequency_hz	Frequency in Hz (e.g. 868000000). Must match Air unit exactly.
p2p_key	Only if encryption is enabled on Air unit. Same 64-char HEX key.

2.4 Power on and pair

15. Hold power button until LED is solid blue → ready to pair.
16. Open Loko app → grant Bluetooth permissions → Settings → select Ground unit.
17. Return to main screen. Wait for GPS fix. Location appears on map.

NOTE Multiple Air units supported. Tap a map pin to see device details.

WARNINGS

! WATERPROOF Not waterproof. Keep away from liquids. Always cap the USB port on the Air unit.
! FIRE Do not expose to open flame or extreme heat.
! TEMPERATURE Operate within 0 °C – 40 °C only.
! VOLTAGE Charge at 5V only. Higher voltages will destroy the device.
! RF Do not enclose in metal. Keep away from strong EM sources.
! ANTENNA Mount antenna pointing upward, as high from the ground as possible.
! EYE SAFETY Keep the antenna tip away from children's and animals' eyes.

QUICK-START CHECKLIST

- [ ] Open nolilab.com/loko-config-tool/ in Chrome / Edge
- [ ] Configuration tab → connect Air unit → set all parameters → Save Changes
- [ ] Ground Unit tab → connect Ground unit → match id2 + frequency_hz → Send
- [ ] Power on Air unit — LED blinks red
- [ ] Power on Ground unit — LED solid blue
- [ ] Loko app → Settings → pair Ground unit
- [ ] Wait for GPS fix — location appears on map

LINKS

configurator nolilab.com/loko-config-tool/
mobile app nolilab.com/software/
battery calc nolilab.com/loko-config-tool/

nolilab.com