



LONG RANGE RADIO QUICK START GUIDE

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Using this manual

Hovermap is a powerful system that can be used as a Lidar mapping payload but also as an advanced autopilot for drones. It is therefore recommended to read the user manual thoroughly to make use of all its capabilities in a safe and productive way.

Disclaimer and safety guidelines

This product is not a toy and must not be used by any person under the age of 18. It must be operated with caution, common sense, and in accordance with the instructions in the user manual. Failure to operate it in a safe and responsible manner could result in product loss or injury.

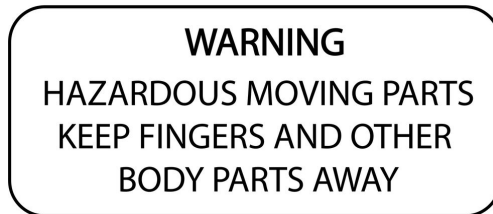
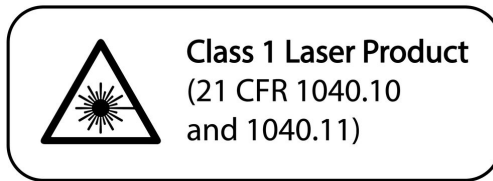
By using this product, you hereby agree that you are solely responsible for your own conduct while using it, and for any consequences thereof. You also agree to use this product only for purposes that are in accordance with all applicable laws, rules and regulations.

The use of Remotely Piloted Aircraft Systems (RPAS) may result in serious injury, death, or property damage if operated without proper training and due care. Before using an RPAS, you must ensure that you are suitably qualified, have received all necessary training, and read all relevant instructions, including the user manual. When using an RPAS, you must adopt safe practices and procedures at all times.



Warnings

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- Always be aware of moving objects that may cause serious injury, such as spinning propellers or other components. *Never* approach a drone while the propellers are spinning or attempt to catch an airborne drone.





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1. Overview

The Long Radio Radio (LRR) is a Hovermap accessory designed to extend data connectivity beyond typical Wi-Fi ranges. Tailored for **Pilot Assist** or **Autonomous** mode missions, it ensures uninterrupted communication between the operator and the Hovermap over extended distances.


This capability is particularly beneficial for above-ground data capture applications such as aerial surveying and infrastructure inspection, where maintaining a reliable data link is crucial for mission success.

i LRR can also be used in **Mapping** mode missions, provided the Hovermap is used on a drone.

2. Specifications

Dimensions and Weight	
Air-Side	<ul style="list-style-type: none"> • 285g (with 915MHz antennas) • 260g (with 2.4GHz antennas) • 32mm x 94mm x 120mm (without antennas)
Ground-Side	<ul style="list-style-type: none"> • 750g (with battery and 915MHz antennas) • 725g (with battery and 2.4GHz antennas) • 70mm x 70mm x 150mm (without antennas)



Operating Frequency and Power (Long Range Link)	
2.4GHz Model	EU/UK: 2447-2457MHz @ 20dBm EIRP JP: 2447-2457MHz @ 20dBm EIRP AU/NZ/US/CA: 2447-2457MHz @ 30dBm EIRP
915GHz Model	AU/NZ/US/CA: 916-926MHz @ 30dBm EIRP
Operating Frequency and Power (Ground-side Wi-Fi Access Point)	
All Models	2437-2447MHz @ 20dBm EIRP
Max Distance	
2.4GHz Model	EU/UK: 200m JP: 200m AU/NZ/US/CA: 900m
915GHz Model	AU/NZ/US/CA: 1500m
<div style="border: 1px solid #0070C0; border-radius: 10px; padding: 10px; background-color: #D9E1F2; display: inline-block;">  All specified ranges are subject to environment and product configuration </div>	
Throughput	
All Models	up to 20Mbps
Data Encryption	
All Models	128-bit AES hardware data encryption

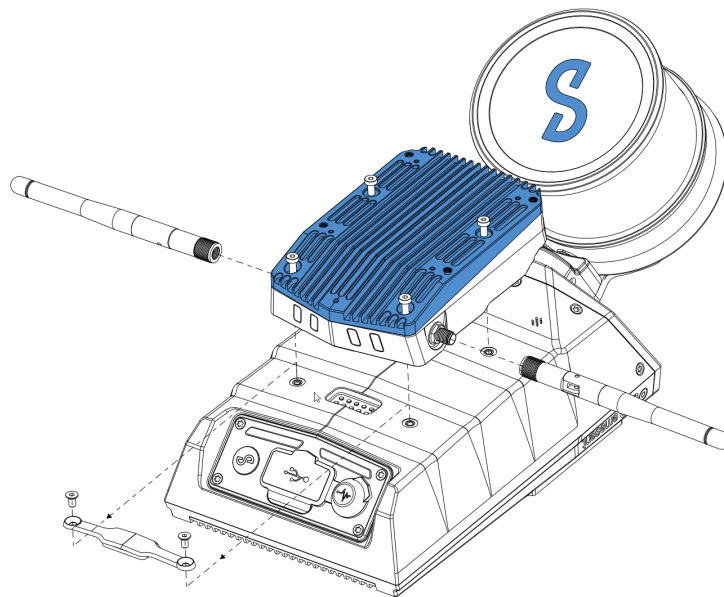


Power	
Air-Side	9-20V (15W)
Ground-Side	7.2V (14W)
Operating Temperature	
All Models	-10°C to 45°C (14°F to 113° F)
Ingress Protection	
All Models	IP65
Hovermap Compatibility	
All Models	ST/STX
Approved Regions	
2.4GHz Model	<ul style="list-style-type: none"> • EU/UK • Japan • Australia / New Zealand / USA / Canada
915GHz Model	<ul style="list-style-type: none"> • Australia / New Zealand / USA / Canada



3. Radio Setup

3.1 Air-Side Radio Setup



Step 1: While Hovermap is powered off and unplugged, clean the bottom shroud of the Hovermap with a water-damped cloth.

STEP 2: Unfasten the Smart Connector cover from Hovermap using the included 2mm hex key.

STEP 3: Apply a threadlocker (Loctite 222 or equivalent) to the exposed threads of the four air-side radio mounting screws.

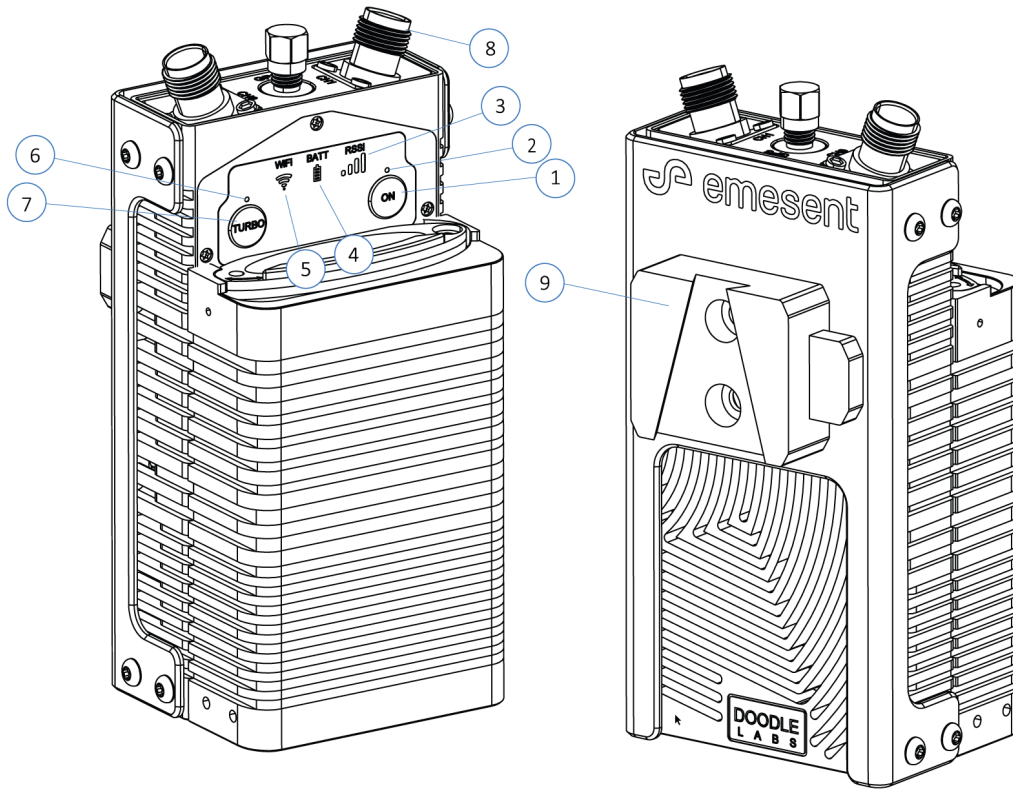
STEP 4: Locate the air-side radio on the bottom of Hovermap as pictured.

STEP 5: Fasten each of the four screws on the air-side radio by a small amount at a time, until the radio is securely mounted to the Hovermap.

i Do not exceed a torque of 1 Nm.

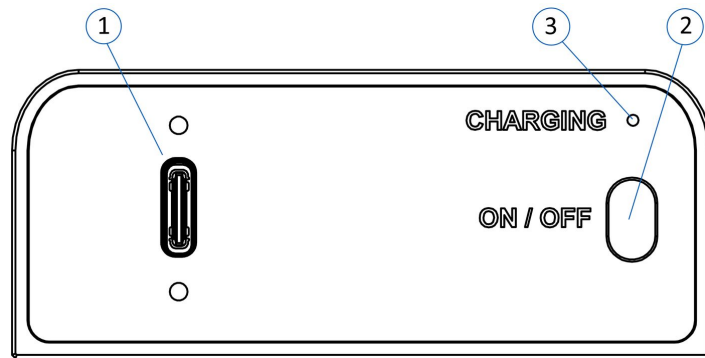


3.2 Ground-Side Radio Setup



1	Power button
2	Power LED
3	RSSI indicator
4	Battery level indicator
5	Wi-Fi indicator

6	Turbo LED
7	Turbo button
8	Antennas
9	Quick release



1	USB-C charging port
<ul style="list-style-type: none"> • Use a standard USB-PD-compliant power • See the battery datasheet for requirements 	
2	Battery Power button
<ul style="list-style-type: none"> • Press and hold down for 5 seconds to turn the battery on/off • When connected to the radio, press and hold for 10 seconds to turn the radio on/off • See the battery datasheet for details 	
3	Battery charging indicator
<ul style="list-style-type: none"> • See the battery datasheet for details 	



3.2.1 Attaching the Battery

The battery is attached to the radio using a simple locking mechanism.

STEP 1: Align the legs of the battery with the corresponding holes in the radio casing.

STEP 2: Slide the battery in place then rotate the locking mechanism. The following shows the disassembled battery and radio unit.



1	Locking mechanism
2	Alignment leg
3	Alignment hole
4	Battery electrical contact
5	Radio power electrical contact



3.2.2 Radio/Battery Buttons and Indicators

The following tables provide information on the buttons and indicators for the Ground-Side radio and the battery.

3.2.2.1 Button and Indicator Functions

Button / Indicator	Function
Power button (ON)	Switch the radio between the different power states (see Power States)
Turbo button	Manually toggle between 1x1 and 2x2 MIMO operation for power savings
Power LED	Indicates the power mode
Turbo LED	Indicates whether the radio is in 1x1 or 2x2 MIMO mode
RSSI Indicator	Indicates the RSSI on the LRR interface
Battery indicator	Indicates the battery status
Wi-Fi indicator	Shows whether Wi-Fi is on or off; it does not display signal strength
Battery Power Button	Press and hold for 5 seconds to switch the battery on/off



3.2.2.2 Power States

Mode	Description	Power LED Status
On	The radio is fully on	On
Off	The radio is in extremely low-power mode and only essential components remain on	Off

3.2.2.3 Radio Power Button Usage

Power Button Action	Operation
4-second press	On -> Off Off -> On

3.2.2.4 LED Behavior for Different Operating States

Condition	Power LED	Wi-Fi Indicator	RSSi Indicator
Radio booting up	Slow blinking (1200ms interval)	Slow blinking (1200ms interval)	Slow blinking (1200ms interval)
ON	Steady	See RSSi and Wi-Fi Indicators	See RSSi and Wi-Fi Indicators



3.2.2.5 RSSI and Wi-Fi Indicators

Status	RSSI indicator	Wi-Fi indicator
Not associated	OFF	OFF
Associated but the link was lost	Slow blink (1800ms interval)	Steady
Connected	Steady; the number of bars illuminated is dependent on the RSSI	Steady

3.2.2.6 Turbo Button and LED Behavior

Button action	Mode	LED Behavior
2-second or longer press	1x1 SISO -> 2x2 MIMO	Blinking (1200ms interval) until link is re-established -> Steady
2-second or longer press	2x2 MIMO -> 1x1 SISO	Blinking (1200ms interval) until link is re-established -> Off



3.2.2.7 Battery Level Indicator

Battery Voltage	LED Indicator
> 7.84 V	Steady, Green
7.39 - 7.84 V	Steady, Yellow
6.5 - 7.39 V	Steady, Red
< 6.5 V	Blinking (1200ms interval), Red

3.3 Initial Setup

STEP 1: Attach the battery to the Ground-Side radio. See [Attaching the Battery](#)

STEP 2: Attach the antennas provided in your kit to the antenna connectors.

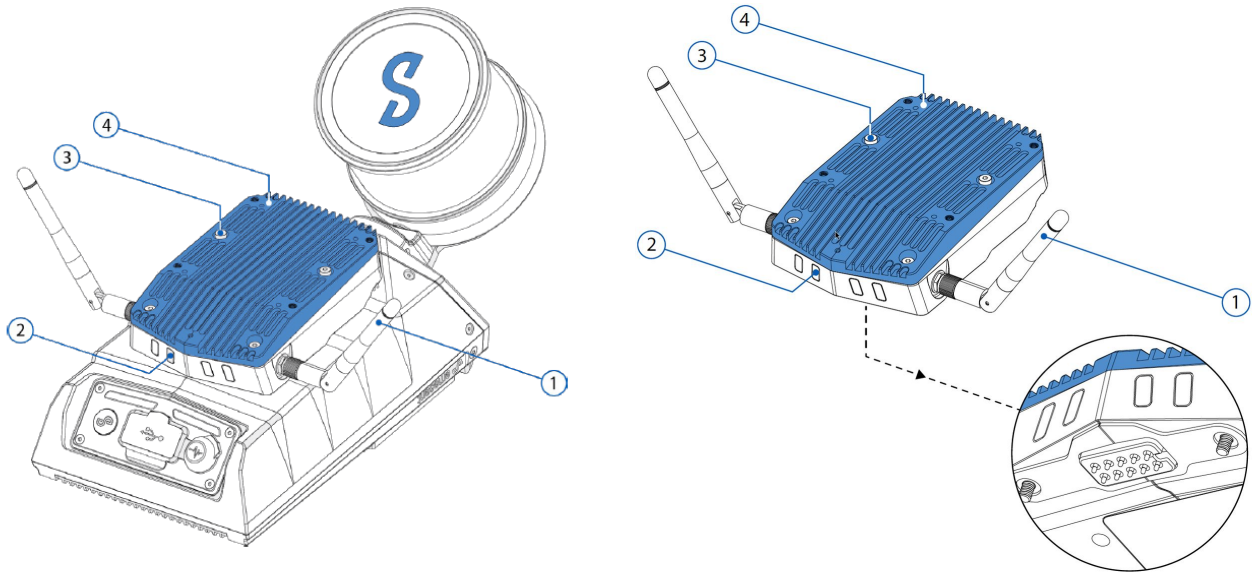
STEP 3: Hold down the battery's ON / OFF power button for 10 seconds.



- The Power LED will blink until the unit has fully booted, at which point it will be steady.
- While booting up, both the Wi-Fi and RSSi indicators will blink. They will switch to a slow blink after boot-up while waiting for a connection. If you have turned on any other radio, the RSSi indicator will eventually hold steady once the radios are connected.
- If you connect to the radio via Wi-Fi, then the Wi-Fi indicator will hold steady.



3.4 Field Setup



1	Antennas
2	Status Indicator LEDs
3	Mounting Screws
4	Heatsink

STEP 1: Mount the Hovermap as desired.

STEP 2: Fasten the antennas on the Air-Side and Ground-Side radios (finger tight).

STEP 3: Position the antennas as shown in the image above.

STEP 4: Power on Hovermap. This will power on the Air-Side radio after 10 seconds.

STEP 5: Separate and maintain a minimum of 5 m (above ground operations) or 10 m (underground operations - due to reflections) of clearance between the Air-Side and Ground-Side radios.

STEP 6: Attach the battery to the Ground-Side radio.



STEP 7: Long press the Ground-Side radio power button for 10 seconds.

STEP 8: Within one minute of powering both radios, the LEDs on the air-side radio and the RSSi LEDs on the Ground-Side radio will change from blinking to solid, indicating a stable connection between both radios.

STEP 9: Mount the Ground-Side radio to the desired operating platform (i.e. belt clip, tablet, or controller bracket).

STEP 10: Open the Wi-Fi settings on your tablet and connect to the Long Range Radio (LRR) Wi-Fi network. LRR creates a Wi-Fi network containing the serial number of the Hovermap. For example, the network name for **ST0035** will be **lrr_st_0035**.

i To enable or disable Turbo Mode, press and hold the **TURBO** button for 3 seconds. Activating Turbo Mode can improve radio performance in congested or obstructed environments, but it will slightly decrease the battery life.

i Do not connect to the Hovermap network (st_xxxx). In Emesent Commander, a successful connection will show **LRR** next to the Wi-Fi signal strength indicator. The tablet will be unable to connect to the LRR Wi-Fi network until both radios have a stable connection.

i Upon the first use of your LRR unit, it may take up to two minutes for the Wi-Fi network to display with the correct name.



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