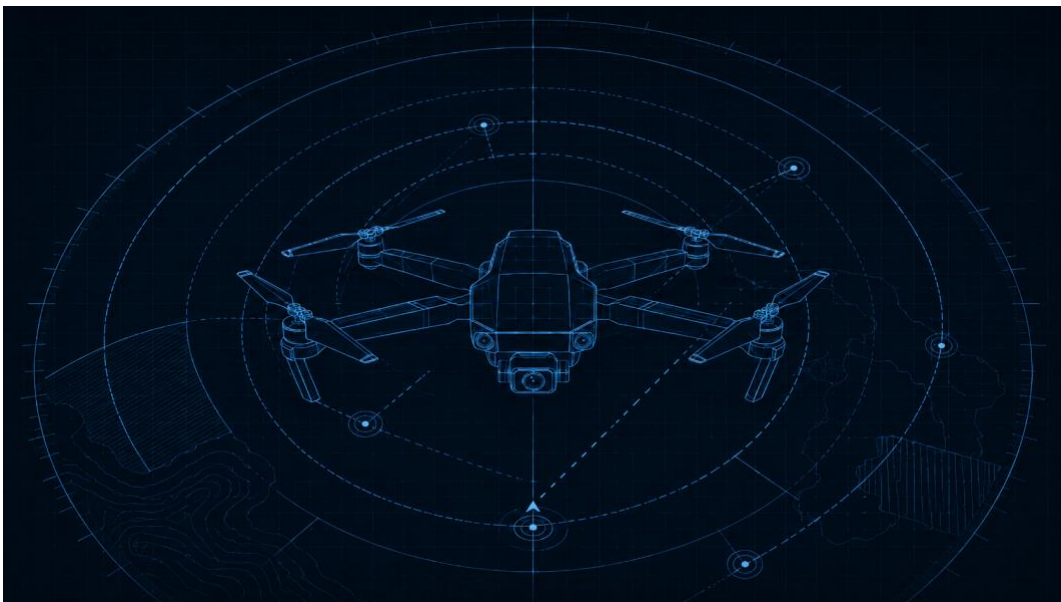


N O X D R E N , L L C

RangeSight

Operator's Manual



Version 2.0.2

iOS / iPadOS / Android

Edition: May 2026

Powered by RangeIQ™ and RangeIQ+™

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This manual describes RangeSight version 2.0.2 for iOS, iPadOS, and Android. Screen captures throughout this document were taken on iOS. The Android user interface is visually and functionally near-identical; platform-specific differences are called out inline where relevant.

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RangeSight is provided as a flight-planning aid. It is not a safety system, certified aviation tool, or navigation device. Use of RangeSight does not relieve you of your obligation to comply with all applicable laws, regulations, and aviation rules in your jurisdiction. See Chapter 13 ("Safety and Best Practices") and Chapter 15 ("Legal Notices") for the full disclaimer.

For the latest version of this manual, visit <https://rangesight.io/manual.html>.

Document Control

Document title	RangeSight Operator's Manual
Software version	2.0.2
Edition	First edition, May 2026
Publisher	Noxdren, LLC — Louisville, Kentucky, USA

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Introduction

1.1 What RangeSight Does

RangeSight is a pre-flight planning tool for unmanned aircraft operators. Given your aircraft, your route, and current weather, it runs a physics-based simulation and returns a go or no-go decision. A generic "30 percent reserve" rule does not account for weather, payload, or aircraft condition. RangeSight does.

It does this in two modes. The first, RangeIQ™, is a point-to-point analysis: given a home location and a single destination, it draws a colour-coded "safe-return ring" indicating how far you can fly before battery reserves no longer guarantee a safe return-to-home. The second mode, RangeIQ+™, extends the analysis to multi-leg waypoint missions: it evaluates each leg against the predicted wind aloft, computes per-leg battery consumption, and flags any leg that becomes infeasible due to headwind or insufficient reserve.

RangeSight is a planning aid. It does not control the aircraft, does not monitor flight in real time, and does not replace pilot judgment, situational awareness, or compliance with applicable aviation regulations. Read Chapter 13 before relying on any output from this application.



F I G - 1

1.2 RangeIQ and RangeIQ+: The Two Engines

RangeIQ is the on-device engine. It computes single-point range estimates locally using your drone's published performance curve, the live weather snapshot, the payload weight you enter, and your selected battery reserve threshold. Because it runs on the phone, RangeIQ works offline once weather has been fetched and operates with no network round-trip.

RangeIQ+ is the server-side engine, hosted at api.noxdren.com. Multi-leg mission analysis is computationally intensive and runs on Noxdren's infrastructure, which keeps results consistent across the full set of supported aircraft and devices. When you import a flight file, RangeSight uploads only the route geometry and your mission parameters, the server returns the analysis, and the result is rendered locally. No identifying information is sent with the request, and route data is not retained after analysis.

Both engines share a single analysis approach and produce consistent results for the same set of inputs. RangeIQ+ extends, rather than replaces, the point-to-point analysis RangeIQ provides. Point-to-point analyses can still be performed at any time.

I M P O R T A N T

RangeSight Pro unlocks RangeIQ+ multi-leg mission analysis, live Personal Weather Station data, offline map downloads, advanced calibration, custom drones, and payload weight modelling. See Chapter 10 for subscription details and the 14-day free trial.

1.3 Who This App Is For

RangeSight is built for operators who fly far enough that visual estimation stops being adequate. Typical users:

- Commercial drone pilots flying under FAA Part 107 (United States), EASA Open and Specific categories (European Union), Transport Canada Basic and Advanced (Canada), CAA Specific (United Kingdom), and equivalent regimes worldwide.
- Survey, inspection, and mapping operators who plan long-distance or BVLOS-style routes under appropriate waivers and need leg-by-leg battery confidence before committing the aircraft.
- Public-safety and search-and-rescue teams who deploy in unfamiliar terrain and need rapid go/no-go answers using current local weather rather than the previous day's forecast.
- Serious recreational pilots flying capable long-range platforms who want quantified margin instead of intuition.

If you fly a sub-250-gram quadcopter close to yourself for recreation, the app works but offers little you cannot judge by eye. RangeSight is built for the edge of the envelope.

1.4 Important Safety Notice

S A F E T Y

RangeSight is a planning aid only. It is not a navigation device, not a safety system, and not a certified aviation tool. All flight decisions remain the sole responsibility of the pilot in command. You must independently verify all flight-critical information before and during every flight, comply with all

applicable laws and regulations in your jurisdiction, and maintain manual control capability and real-time situational awareness at all times. Apparent agreement between RangeSight and reality is never a substitute for pre-flight inspection, current weather observation, airspace verification, or pilot judgment.

By using RangeSight you acknowledge that you have read, understood, and agreed to the full Disclaimer presented on first launch and available at any time from the menu. Chapter 13 expands on safety and best practices; Chapter 15 reproduces the legal notices in full.

Getting Started

2.1 Installing RangeSight

RangeSight is distributed exclusively through the Apple App Store and the Google Play Store. Installations from any other source (direct .ipa or .apk files from third-party websites) are not authorized, not supported, and may contain modifications that compromise your data or aircraft.

P L A T F O R M N O T E

iOS requires iPadOS or iOS 26.2 or later. iPad runs in full-screen portrait. Android requires Android 9 (API 28) or later with Google Play Services. Both platforms need an active internet connection on first launch to fetch weather and initialize the subscription system.

I O S / I P A D O S

1. Open the App Store on your iPhone or iPad.
2. Search for "RangeSight" by Noxdren, LLC.
3. Tap GET and authenticate with Face ID, Touch ID, or your Apple ID password.
4. When the download completes, tap OPEN.

A N D R O I D

1. Open the Google Play Store on your Android device.
2. Search for "RangeSight" by Noxdren, LLC.
3. Tap Install.
4. When installation completes, tap Open.

2.2 First Launch Flow

Opening the app for the first time runs you through a brief sequence before the home screen appears. From cold start the order is: splash screen, legal disclaimer, location-permission disclosure, system permission dialog, guided tour, home screen. Each step is described below.

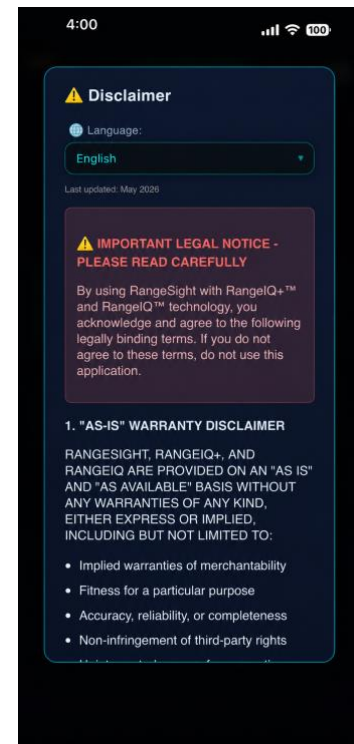
S P L A S H S C R E E N

A 2.2-second branded splash appears at launch. The RangeSight logo fades in over a dark background, holds, then fades out as the main view loads. After first launch this splash continues to display on every subsequent cold start; it is part of the normal launch experience, not a setup step.

L E G A L D I S C L A I M E R

After the splash, RangeSight presents the legal Disclaimer as a full-screen modal. Read it. The Disclaimer is the legally binding agreement between you and Noxdren, LLC governing use of the application; once accepted it is also available at any time from the menu (More > Disclaimer).

Tap I Agree to continue. If you do not agree, close the app and uninstall it.



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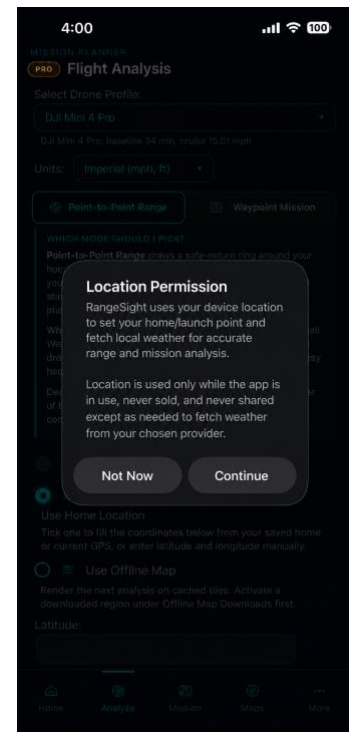
I M P O R T A N T

The Disclaimer is available in two languages, English and Spanish, via the language selector at the top of the modal. All translations are non-binding; the English text controls for legal purposes.

LOCATION PERMISSION DISCLOSURE

After accepting the Disclaimer, RangeSight shows its own location permission disclosure before the system dialog. The disclosure explains in plain language why location is requested (to center the analysis map on your launch point and to pull weather from the right area). Tap Continue.

The system permission dialog appears next. Choose Allow While Using the App. RangeSight does not require Always permission; selecting Allow Once works but prompts on every launch. Selecting Don't Allow leaves the app usable, with home location entered by hand and no live weather.



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PLATFORM NOTE

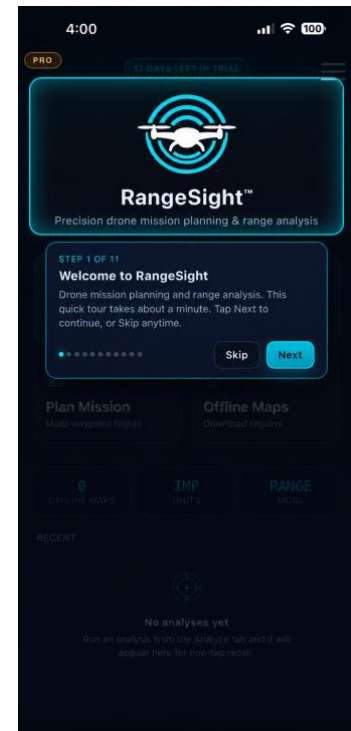
On Android the equivalent permission is Approximate or Precise Location > Only this time / While using the app. Precise is preferred for weather-station selection; Approximate works but may pull weather from a station kilometers distant.

TAKE A TOUR

A guided walkthrough starts automatically after the location flow. It highlights eleven points across the home screen and the Analyze form: the three primary tiles (Analyze Range, Plan Mission, Offline Maps), the More menu, the mode toggle, the drone selector, the Home Location section, Advanced Fine-Tuning, Offline Map Downloads, and the Generate Map button.

Each step shows a spotlight on the relevant control with a brief explanation. Tap Next to advance, or Skip Tour to exit and go straight to the home screen. Pro-only features are skipped automatically on the free tier.

The tour runs only once. To replay it later, open the More menu and tap Take a Tour.



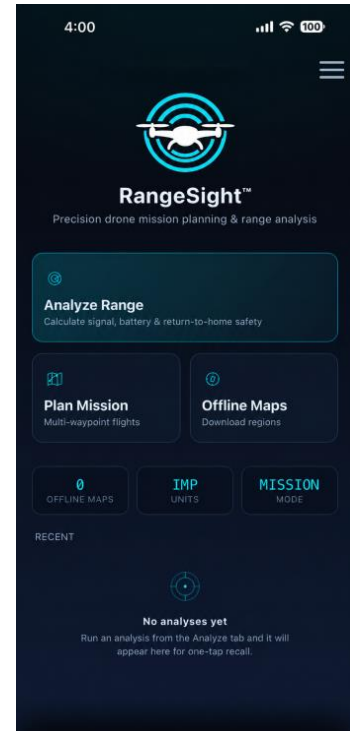
F I G - 4

PRO TIP

The tour is the fastest way for someone new to the app to understand the layout. Even if you skip it on first launch, consider running it once when you have five minutes to spare.

2.3 The Home Screen

After the first-launch flow, the home screen is what you see every time you open RangeSight. It is structured as a brand hero block at the top, three primary tiles, a stat row, and (once you have run any analyses) a Recent list. The bottom navigation bar lives below all of this and is the same on every screen.



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L A Y O U T A N A T O M Y

E L E M E N T	F U N C T I O N
PRO badge	Top-left of the home screen. Appears only when an active RangeSight Pro subscription is detected.
Hamburger menu	Top-right (icon: three horizontal lines). Opens the More panel: About, FAQ, Tips & Tricks, User Manual, Take a Tour, Settings, What's New, Contact, Disclaimer, Terms of Service, Privacy Policy, Upgrade to Pro.
Brand hero	RangeSight logo, wordmark, and tagline. Decorative.
Analyze Range tile	Primary action. Opens the Analyze form for Point-to-Point range analysis.
Plan Mission tile	Opens the Analyze form pre-set to Waypoint Mission mode for multi-leg analysis.
Offline Maps tile	Opens the offline-map manager (preset regions, custom area, manage storage).

Stat row	Three glanceable stats: number of offline regions stored, current units (Imperial / Metric), and current mode (Point-to-Point / Waypoint).
Recent analyses	List of the last five analyses, each restorable with a single tap. Mission entries show filename and waypoint count; range entries show coordinates.
Bottom navigation	Five tabs: Home, Analyze, Mission, Maps, More. Persistent across all screens. The app reopens to whichever tab you last used.

RECENT ANALYSES

Below the stat row, the home screen shows up to five recently run analyses, ordered newest first. Each tile carries a one-tap action that restores the original analysis with no re-entry:

- Range entries show the saved coordinates and units. Tapping opens the Analyze form with every field restored. Re-running produces a fresh result using current weather.
- Mission entries show the mission filename and a short summary ("14 WP · 2.4 mi"). Tapping loads the stored analysis result directly, no re-import required.
- Pro subscribers see a Refresh icon on each card. It pulls live weather and re-runs the analysis without going through the form again.

The list auto-prunes to the five most recent entries. The Clear button at the top of the list empties it; this does not delete the underlying mission files or saved coordinates, only the shortcut tiles. If a mission file is deleted from the filesystem, its Recent entry is automatically removed.

IMPORTANT

Recent analyses are saved in your browser's local storage. They are not synced to iCloud or to a Noxdren server. Reinstalling the app clears the list.

2.4 Bottom Navigation

The bottom-nav bar is fixed at the bottom of every screen and is the primary way to move between the four functional areas:

T A B	W H A T I T O P E N S
Home	The landing screen described in 2.3. Shows the hero, three tiles, stat row, and Recent analyses.

Analyze	The Range / Mission analysis form. The mode toggle at the top of the form determines whether you are configuring a Point-to-Point range or a Waypoint Mission.
Mission	The mission file library. Shows the imported missions list, lets you import new files, choose a folder for bulk discovery, and select a mission for analysis.
Maps	The Offline Maps panel. Preset regions, custom area selector, the active offline map indicator, and Manage Storage.
More	The full menu (same items as the hamburger button on the home screen): About, FAQ, Tips & Tricks, User Manual, Take a Tour, Settings, What's New, Contact, Disclaimer, Terms of Service, Privacy Policy, Upgrade to Pro.

RangeSight remembers which tab you were on when you last closed the app and opens to that tab on next launch. If you close from the Mission tab and reopen, you return to Mission, not Home.

2.5 The Mode Toggle

The Analyze form has a mode toggle at the top with two options: Point-to-Point Range and Waypoint Mission. The choice drives which form fields appear and which engine runs.

- Point-to-Point Range runs RangeIQ. You enter a single home location and the engine produces concentric safe-return rings on the map.
- Waypoint Mission runs RangeIQ+. You import a multi-leg flight file and the engine analyzes every leg in sequence.

Switching modes preserves every other setting (drone, payload, weather, home location). Only the analysis target changes. There is no harm in flipping between modes while exploring; the form recomposes instantly.

I M P O R T A N T

Waypoint Mission is a Pro feature. On the free tier, selecting Waypoint Mission reveals an amber banner explaining what Pro unlocks; tapping the banner opens the upgrade modal pre-scrolled to the mission feature. The form fields themselves do not appear until Pro is active.

2.6 Choosing Units

RangeSight supports Imperial (mph, feet, Fahrenheit) and Metric (m/s and km/h, meters and kilometers, Celsius). The default depends on your operating-system region; the United States starts in Imperial, most of the rest of the world in Metric.

Change units in More > Settings > Units. The change takes effect immediately throughout the app, including any open analysis results.

P R O T I P

Mission file imports always preserve the units used in the original file. RangeSight converts at display time only. A Litchi mission authored in meters still imports cleanly when the app is set to Imperial; the underlying data and analysis are unchanged.

Selecting Your Drone

3.1 Why Drone Selection Matters

Every drone has a different performance curve. A DJI Mavic 3 Pro and a Parrot ANAFI Ai both publish 32-minute flight times, but they reach those numbers with different propeller efficiencies, battery chemistries, and motor loads. The same wind condition that barely dents one aircraft's reserves can drain another's much faster, even at identical published flight times.

RangeSight ships with 31 commercial drone profiles. Each profile carries the manufacturer's published specifications along with the additional parameters needed to model that specific airframe accurately under the conditions you intend to fly in, including per-color weather thresholds. Picking the right profile is the single most important input you provide. The wrong one produces confident-looking numbers that are wrong.

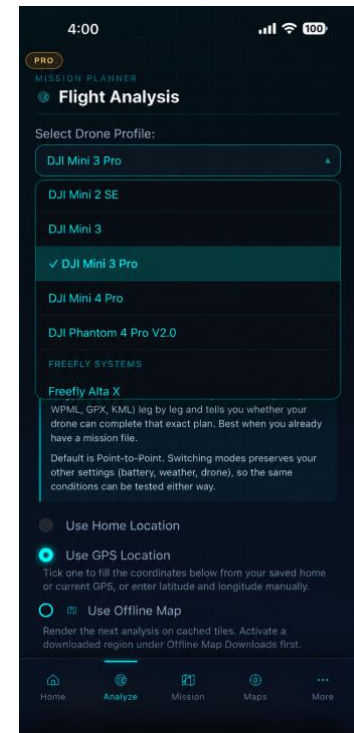
S A F E T Y

If your aircraft has been modified beyond the factory build (aftermarket propellers, oversized batteries, an external payload mount, a third-party gimbal), the published curve no longer applies. Build a custom profile in the Custom Drone Builder (section 3.3), or fine-tune the factory profile with Advanced Fine-Tuning (section 3.5) so the engine matches what your aircraft actually does.

3.2 Picking from the Built-in Library

The drone library lives at the top of the Analyze form. Tap the drone dropdown; a list of all 31 supported aircraft appears, grouped by manufacturer (Autel, DJI, Freefly, Parrot, Skydio).

1. Tap the drone dropdown on the Analyze form.
2. Scroll the alphabetical list or type a model name in the search field.
3. Tap your model. The dropdown closes and the profile activates.
4. Confirm the specs panel below the dropdown matches your aircraft. If the takeoff weight, baseline flight time, or cruise speed is off, your profile or aircraft has been modified and you should use the Custom Drone Builder instead.



P R O T I P

RangeSight remembers your last-used drone across launches. If you fly the same aircraft each session, you only have to select it once.

3.3 Custom Drone Builder

If your drone is not in the built-in library, or if you fly a modified airframe, build a profile from scratch with the Custom Drone Builder. Open it by tapping Custom Drone Builder in the Analyze form (the section expands inline; it is not a separate menu item).

Two editing modes are available. Simple Mode collects eight specifications you will find on any manufacturer's product page. Advanced Mode adds additional tuning parameters that adjust the app's response to your aircraft in wind. Start with Simple unless you have observed your drone's hover behavior and wind tolerance in real flight.

S I M P L E M O D E

Simple Mode collects:

- Drone Name (free text)
- Manufacturer (DJI, Autel, Skydio, etc.)
- Total Weight at takeoff, in grams
- Battery Capacity, in mAh
- Battery Cells (2S, 3S, 4S, or 6S, from a dropdown). Voltage is derived from cell count, not entered directly.
- Actual Flight Time in minutes, as observed in the air with this battery and load
- Cruise Speed in mph (a comfortable cruise, not max)
- Max Speed in mph (the published maximum)

From these eight values RangeSight derives a conservative operating profile. The result is intentionally pessimistic relative to a fully calibrated profile, but produces a safe baseline starting point for unfamiliar aircraft.

A D V A N C E D M O D E

Advanced Mode exposes additional tuning parameters. Use it when you have observed how your aircraft handles in a steady hover, how it tolerates wind before getting pushed off course, or want to set custom thresholds for the green-yellow-red indicators.

- Mass and Baseline Flight Time (as in Simple Mode)
- Cruise Speed and Max Speed, in m/s
- Hover Drain rate, in percent per minute, as observed during a steady hover test in calm conditions
- Payload Slope: a tuning value scaling payload against response

A screenshot of the 'Custom Drone Builder' screen in the RangeSight app. The screen is dark-themed with teal accents. At the top, it says 'PRO' and 'Custom Drone Builder'. Below that, there's a section 'Start with a template (optional):' with a dropdown menu showing '- Select a template -'. Then, 'Input Mode:' has two options: 'Simple (Recommended)' (selected with a blue dot) and 'Advanced'. A teal box explains 'Simple Mode: Enter basic specs (weight, battery, flight time). Advanced parameters are auto-calculated from typical values.' Below this, there are input fields for 'Drone Name' (filled with 'Garage 5" Freestyle'), 'Manufacturer' (filled with 'Custom Build'), and 'Physical & Battery' section. This section includes 'Total Weight (including battery):' (filled with '580'), 'Battery Capacity (mAh):' (filled with '1300'), and 'Battery Cells (S):' (a dropdown menu showing '6S (22.2V)'). At the bottom, there's a navigation bar with icons for Home, Analyze (active), Mission, Maps, and More.

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- Efficiency Floor: a lower bound on aircraft efficiency used in heavily-loaded scenarios
- Battery Reserve fraction: the safe-landing threshold treated as the bottom of usable battery for the selected aircraft
- Takeoff Penalty fraction: the fixed battery cost the app attributes to every takeoff, set via in-app guidance
- Wind Shear Exponent: a tuning value for wind versus altitude
- Per-color thresholds for wind, gust, and temperature (green, yellow, and red maxima)
- Headwind Penalty: a tuning value for facing into the wind

Each field has a small (i) icon. Tap it for a one-sentence explanation of the parameter and the range RangeSight considers reasonable. The Save button remains disabled until every required field has a valid value.

3.4 Templates

Six built-in templates pre-populate the Custom Drone Builder for common airframe categories. Tap "Start with a template" at the top of the builder; a modal opens with these presets:

- Micro Drone (under 200 grams)
- Mini Camera Drone (200 to 300 grams)
- Standard Photography (500 to 800 grams)
- Racing Quad (400 to 600 grams)
- Cinematic (800 to 1200 grams)
- Heavy Lifter (1500 to 3000 grams)

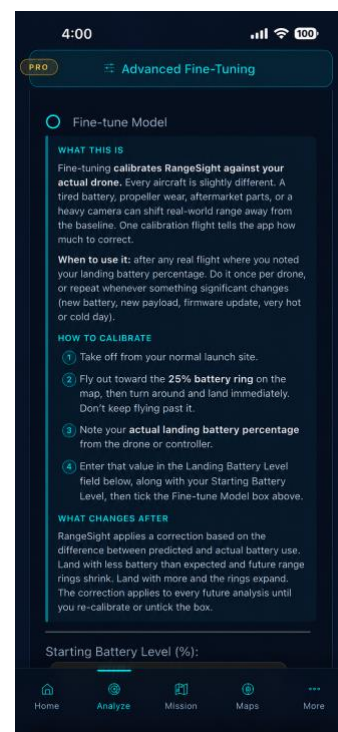
Templates are starting points. Review every field before saving and adjust for your specific airframe, battery, and typical payload. A 700-gram custom build is not the same as the 800-gram preset that happens to be closest.

3.5 Advanced Fine-Tuning

Advanced Fine-Tuning calibrates the selected drone profile to your specific aircraft's observed performance. It uses one real flight, not five. You fly out to the 25 percent battery-reserve ring on the analysis map, land, enter the start and landing battery percentages, and tick the Fine-tune Model checkbox. Subsequent analyses use those two values to bias the engine toward your aircraft's measured behavior.

1. Run an analysis as normal and note where the outer green ring (25 percent reserve) intersects a recognizable landmark.
2. Fly out to that landmark and back, departing with a known starting battery percentage.
3. Note the starting battery and the landing battery percentages.
4. Open the Advanced Fine-Tuning controls in the Analyze form (below the drone selector).
5. Enter Starting Battery Level and Landing Battery Level.
6. Tick the Fine-tune Model checkbox.
7. Re-run the analysis. The rings shift to reflect your aircraft's actual flight, not the manufacturer's published numbers.

Fine-tuning is sticky. Once enabled with values entered, every subsequent analysis uses the calibration until you uncheck the Fine-tune Model box. Calibration is per-profile, so different aircraft each carry their own offsets.



I M P O R T A N T

Advanced Fine-Tuning is a Pro feature. The controls appear in the form for all users, but only Pro subscribers can apply the calibration; on the free tier the values save but do not modify the analysis output.

Setting Your Launch Point

4.1 Why the Home Point Matters

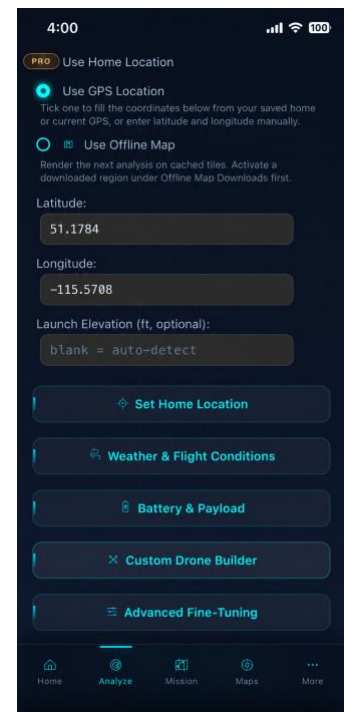
Every RangeSight analysis is anchored to a single point you designate as home. This is the launch site, the spot the aircraft must return to before battery reserves fall below the safe threshold. The home point also drives the weather lookup: meteorological data comes from the area around this coordinate.

Accuracy matters. A home point that is one kilometer off can produce range estimates wrong by roughly the same amount in the opposite direction. The safe-return ring is centered on whatever point you specify, not on where the aircraft actually launched.

4.2 Using Current GPS Location

If you are at the launch site when running the analysis, set home from the device's GPS:

1. On the Analyze form, find the Use Home Location section.
2. Tap Use GPS Location. The device's location services start acquiring a fix; latitude and longitude populate within a few seconds.
3. Wait until the coordinates stop changing. The fields refresh briefly as the GPS refines the fix; once they hold steady, the location is good.



P R O T I P

GPS accuracy improves substantially after thirty seconds outdoors with a clear view of the sky. Launching the app indoors and immediately requesting location will produce a slow or imprecise fix. Step outside before requesting GPS.

4.3 Entering Coordinates Manually

If you are planning a flight from somewhere other than your current position (scouting a job site the night before, working from a survey-grid launch coordinate), enter the coordinates by hand.

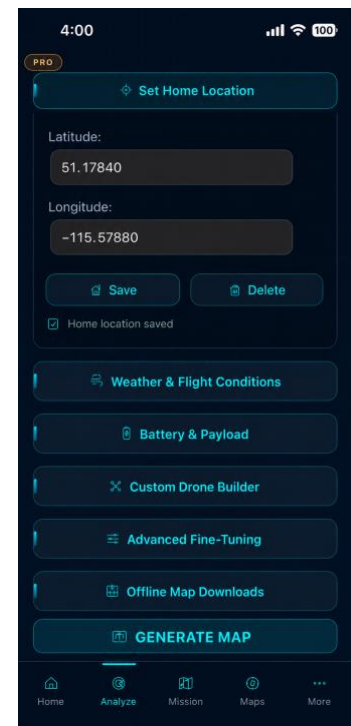
1. Disable the Use GPS Location toggle if it is on.
2. Tap the Latitude field. Enter decimal degrees. Northern hemisphere is positive; southern is negative.
3. Tap the Longitude field. Enter decimal degrees. Eastern hemisphere is positive; western is negative.

RangeSight accepts decimal degrees (47.2089898). It does not accept Universal Transverse Mercator (UTM), Military Grid Reference System (MGRS), or degrees-minutes-seconds notation. Convert to decimal degrees before entering.

4.4 Saving the Home Location

RangeSight remembers a single home location across launches. After entering or acquiring coordinates, tap Save Home Location at the bottom of the panel. The values persist locally on the device and reload the next time the app opens.

To replace the saved location, set a new coordinate (via GPS or manual entry) and tap Save Home Location again. The new value overwrites the old. To clear it, tap Delete Home Location.



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I M P O R T A N T

RangeSight does not maintain a list of named locations or multiple home points. The app stores exactly one home position, and it is held only on the device. Uninstalling the app or clearing app data removes the stored home; nothing is transmitted to a Noxdren server or synced to iCloud.

Mission Parameters

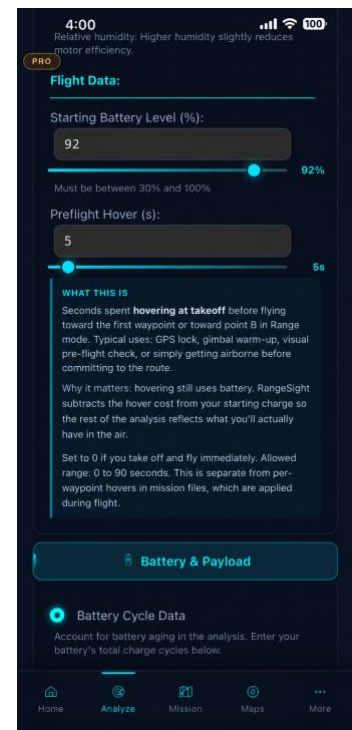
5.1 The Mission Parameter Panel

After selecting a drone and setting your home location, the next phase is entering the mission-specific parameters. These values describe the flight you actually intend to execute, as opposed to the aircraft and the location which describe what you have to execute it with. RangeSight feeds your parameters together with the aircraft profile and the weather snapshot into the engine; small changes here produce significant changes in the safe-return ring and the per-leg battery prediction.

5.2 Battery Level and Reserve Threshold

Two of the most important inputs are the starting battery level and the reserve threshold. The starting level should be the actual voltage-derived percentage shown by your remote controller or flight controller at the point of takeoff, not the nominal "fully charged" assumption. A pack that displays 95 percent on the charger typically settles to roughly 92 percent by the time you have powered up the aircraft and completed pre-flight checks.

The analysis map shows a seven-ring layout (0, 5, 10, 15, 20, 25 percent return battery, plus a one-way maximum boundary). The standard safe-landing threshold is 25 percent, shown as the outer green ring. A drone-specific reserve fraction can be set in the Custom Drone Builder's Advanced Mode, where the Battery Reserve field accepts values within the range shown next to the field. There is no per-mission reserve slider on the form.



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S A F E T Y

Setting a reserve threshold below 20 percent is dangerous on most consumer drones. Lithium polymer cells suffer permanent damage when discharged below approximately 3.0 volts per cell (15-20 percent

state-of-charge), and many flight controllers force an auto-land at 10 percent regardless of pilot input. A reserve threshold below 20 percent is appropriate only if you have characterised your specific cells and know what voltage they actually reach at that state.

5.3 Payload Weight

Payload weight directly affects current draw at every airspeed. RangeSight asks for the total payload as an additional mass beyond the empty drone's takeoff weight. If your drone is published with a 1.2 kg takeoff weight and you have added a 250 gram external battery, your payload entry is 250 grams. If you have removed the factory gimbal (200 g) and replaced it with a lighter cinema camera (150 g), your payload entry is -50 grams (negative). Negative payloads are accepted and meaningfully change the result.

P R O T I P

Payload weight modelling is a Pro feature. The free tier accepts the payload value but does not factor it into the analysis; the Pro tier incorporates your entered payload into the analysis and re-computes safe range accordingly under the conditions given.

5.4 Altitude, Speed, and Hover Time

The remaining three parameters describe the flight envelope:

- Flight altitude — the AGL (above ground level) altitude at which you intend to operate. Higher altitudes mean thinner air and slightly higher current draw to maintain lift; the app accounts for this within its operating range.
- Cruise speed — the airspeed you intend to fly at. Multirotors have a cruise-efficiency sweet spot at moderate speeds; flying slower significantly increases time-of-flight (which dominates range) and flying faster significantly increases drag (which dominates current draw). The default is a sensible starting point for the selected drone.
- Hover time — how much of the mission you expect to spend stationary (e.g., for photography, inspection, or holding position to observe). Hover consumes battery at roughly the same rate as slow forward flight, so accurate hover-time estimation matters.

All three values can be adjusted at any time without re-entering the rest of the panel. Tapping Generate Map will re-run the engine with the new values.

Weather Integration

6.1 Why Weather Drives Range

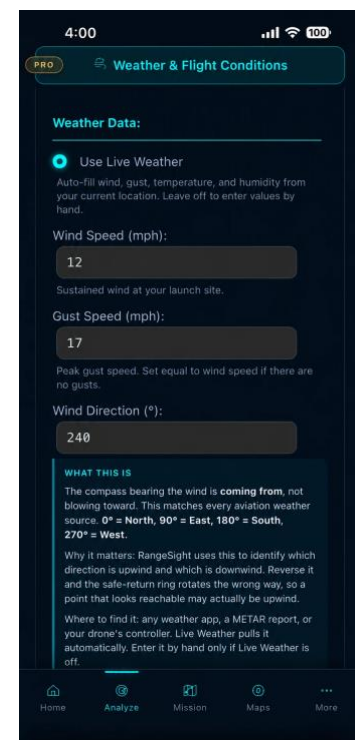
Weather is the dominant exogenous variable in any range calculation. A drone capable of 8 kilometres of round-trip flight in still air may have only 4 kilometres of safe round-trip range with a 6 m/s headwind on the outbound leg; the return leg may benefit from a tailwind, but never enough to fully compensate. RangeSight fetches a live weather snapshot for every analysis and factors it into the next analysis result.

Three weather quantities affect the result: wind, temperature, and air density. Air density is derived from temperature and humidity readings the app already has; barometric pressure is not collected or displayed. Wind affects the time and energy each leg requires; temperature affects battery chemistry (cold packs deliver less energy); density affects how much lift the propellers generate for a given RPM.

6.2 Live Weather: OpenWeatherMap

By default, RangeSight pulls live weather from OpenWeatherMap, a global weather data provider that aggregates observations from national meteorological networks (NOAA in the United States, Deutscher Wetterdienst in Germany, the UK Met Office, etc.). The data is current to within fifteen minutes and is queried automatically when you set or change your home location.

1. Set your home location (Chapter 4).
2. Tap Use Live Weather (the toggle is enabled by default).
3. Within five seconds, the Weather panel populates with wind speed, wind direction, temperature, dust speed (gust), and humidity.
4. If the fetch fails (no internet, server outage), an error banner appears. You can either retry by tapping the refresh icon or enter weather values manually below.



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6.3 Hyperlocal Weather (Optional)

RangeSight Pro can pull readings from personal weather stations near your flight area, giving you hyperlocal weather data instead of broad regional forecasts. This feature is optional and requires a free Weather Underground account, which you create and manage directly with The Weather Company.

Personal weather stations are useful operationally because they update more frequently than the synoptic feed (typically every two to five minutes instead of every fifteen) and because the nearest station may be in the field next door rather than at the regional airport.

ENABLING HYPERLOCAL WEATHER

1. Sign up for a free Weather Underground account at wunderground.com. You may need to register a personal weather station, depending on Weather Underground's current account requirements.
2. From your Weather Underground account, copy your personal API key.
3. In RangeSight, open Settings (☰ ► Settings), scroll to the Weather Underground PWS row, and enter your API key in the field provided.
4. Toggle the Weather Underground PWS switch on. RangeSight will use your key to fetch readings from nearby stations during flight planning.

When hyperlocal weather is enabled, the flight-planning screen displays readings from the nearest personal weather stations, including wind speed, gusts, temperature, and pressure. Station IDs are shown alongside the readings so you can identify the source. Each reading is attributed to its station ID and to Weather Underground inline.

P R O T I P

If you fly the same site repeatedly and a station exists nearby, treat the station ID as part of your pre-flight reference. Long-running stations build a wind pattern over time that is more representative of local conditions than the synoptic forecast.

IF READINGS DO NOT APPEAR

Verify that your Weather Underground API key is correct, that your Weather Underground account is in good standing, and that there are personal weather stations within range of your flight area. RangeSight does not control station availability or Weather Underground service status.

PRIVACY

Your Weather Underground API key is stored only on your device and is sent directly from your device to Weather Underground's servers to retrieve readings. RangeSight does not transmit, store, or share your key on its own servers.

Weather Underground is a trademark of The Weather Company, an IBM Business. RangeSight is an independent third-party application and is not affiliated with, endorsed by, sponsored by, or officially connected with The Weather Company or IBM. Use of the Weather Underground service is governed by the user's own account with The Weather Company and is subject to their terms of service. Weather Underground service availability, data quality, station coverage, and account requirements are outside RangeSight's control.

6.4 Manual Weather Entry

If you cannot reach the internet (common at remote field sites and on construction sites with poor cellular coverage), you can enter weather data manually. Tap the Use Live Weather toggle to disable it; the read-only weather fields become editable.

Sources of manual weather data include:

- Aviation METAR reports from the nearest airport (available via apps like ForeFlight, AeroWeather, or 1800wxbrief.com)
- Marine VHF weather broadcasts (NOAA Weather Radio, US; Coast Guard radio in coastal regions)
- A handheld anemometer (Kestrel 3000 or similar). The most reliable source if you have one
- Observation by experienced pilots already at the site

SAFETY

Manual weather entries are only as good as their source. A METAR from an airport twenty kilometres away may not reflect the wind in a sheltered valley or on a ridgeline. When in doubt, fly a short scouting hover at low altitude before committing to the full mission; observe how the aircraft holds position and adjust your manual entries upward (toward greater wind) before running the analysis.

6.5 Wind Direction Convention

IMPORTANT

Wind direction throughout RangeSight follows the meteorological convention: the direction the wind is coming FROM, in degrees true. A 270-degree wind blows from the west toward the east. This matches

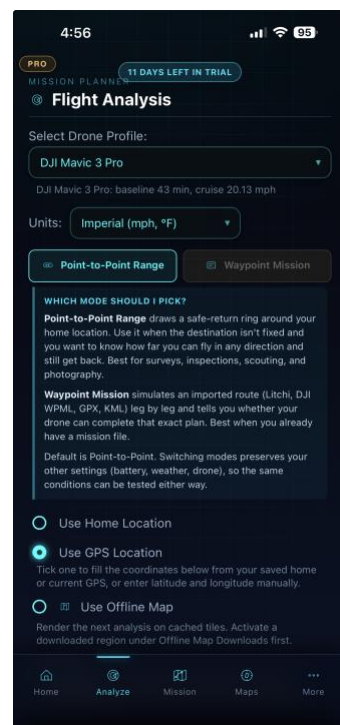
METAR and aviation weather reporting. The wind arrow on the analysis map points in the direction the wind is going (toward the downwind side), so the arrow head and the displayed number describe opposite directions.

If you are used to surface-wind reporting from sources that describe wind by where it is going, mentally invert before entering the number. A wind described as "southerly" in casual conversation is 180 degrees in METAR style and in RangeSight.

Range Analysis (RangeIQ)

7.1 Running a Point-to-Point Analysis

Once your drone, location, parameters, and weather are set, run the analysis by tapping Generate Map at the bottom of the main screen. The on-device engine computes the result in under one second and transitions to the Range Analysis map.



F I G - 1 3

7.2 Reading the Range Analysis Map

The Range Analysis map presents the engine's output as six concentric range rings centred on your home point, each one labelled with the percentage of remaining battery you would have at that distance after a round-trip flight. The rings are color-coded according to risk:

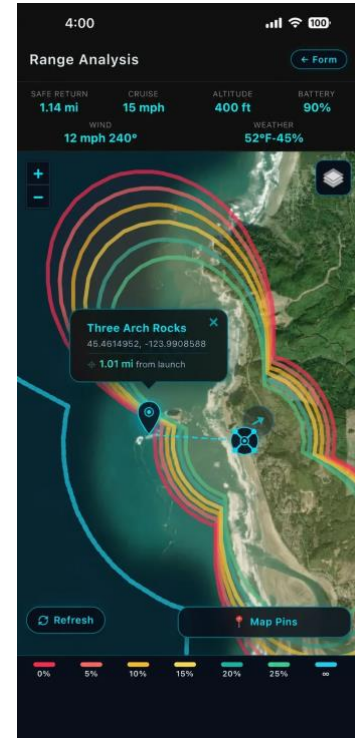


Figure 14

R I N G C O L O U R	M E A N I N G
Green (Safe)	Battery reserve exceeds your configured threshold by a comfortable margin. Round-trip flight to any point inside this ring is safe under the analyzed conditions.
Yellow (Caution)	Battery reserve is at or near the configured threshold. Round-trip flight to points in this ring is feasible but leaves no margin for unexpected events (gust, payload drift, emergency hover).
Red (No-Go)	Battery reserve falls below the configured threshold. Flight to any point in this ring will exhaust the safety reserve before returning. Do not fly here.
Outer black boundary	The maximum theoretical range, the point at which the drone runs out of battery on the return leg. RangeSight will never recommend flying to this boundary; it is shown for reference.

7.3 The Wind-Asymmetric Variant

When wind is non-zero, the range rings are no longer concentric circles — they are offset and distorted toward the downwind direction. A drone flying into a 6 m/s headwind has less range than a drone flying with a 6 m/s tailwind; the safe-return ring reflects this by bulging in the downwind direction and compressing in the upwind direction.

Wind-asymmetric rings tell you which direction you can fly furthest, not just how far. A photographer with a subject 4 km downwind may have ample margin. The same distance upwind can be marginal.

P R O T I P

Hold the device with the top of the screen pointing north (or use rotate the screen to a north-up alignment) when interpreting wind-asymmetric range rings. The visual distortion is easier to read when the wind arrow aligns with the screen's geometry.

7.4 Saving and Sharing Range Results

Range analyzes are not saved by default; they are recomputed on every tap of Generate Map. To preserve a particular result for later reference, tap the Share icon at the top-right of the Range Analysis map. The icon opens the platform share sheet (iOS share sheet or Android share menu) with a rendered PNG of the map and a short text summary including the drone, home coordinates, wind, and ring radii.

P L A T F O R M N O T E

iOS produces the share image as a PNG at the current WebView size (varies with device and orientation). Android matches the device's native screen resolution and additionally exposes a Save to Gallery option directly in the share sheet.

7.5 Stats Bar Above the Map

Every Range Analysis map has a six-cell stats strip pinned to the top of the screen. The cells summarize the analysis parameters so you don't have to remember what you typed into the form:

- Safe Return - the radius of the outer green (25 percent reserve) ring
- Cruise - the cruise speed used for the analysis
- Altitude - the AGL altitude used for the analysis
- Battery - the starting battery percentage used
- Wind - the wind speed and direction (from)
- Weather - a compact temperature and humidity readout

The stats bar is informational only; tap any cell to scroll back to the analysis form if you need to change a value.

7.6 Map Style Switcher

The Range Analysis map opens with the Satellite base layer (Esri World Imagery). Tap the small layers icon in the top right of the map to choose a different style:

- Satellite - aerial imagery (default)
- Street (Day) - OpenStreetMap roads and labels for daytime planning
- Street (Night) - Carto Dark variant, easier on the eyes in low-light conditions
- Terrain - OpenTopoMap topographic shading; useful for ridges and valleys
- Offline Map - your active offline pack, available only when an offline pack has been activated in the Maps tab

RangeSight remembers your style choice across sessions and across both the Range and Mission analysis maps.

7.7 Refresh (Pro)

A small Refresh pill sits at the bottom of the Range Analysis map. Tap it to pull fresh live weather and re-run the engine without going back to the form. Useful at the launch site when wind picks up between your initial planning analysis and the moment of takeoff.

PLATFORM NOTE

Refresh is a Pro feature. Free users see the pill but tapping it opens the upgrade modal instead of re-running the analysis.

7.8 Map Pins

The Map Pins pill at the bottom-right of the Range Analysis map lets you mark destinations of interest. Tap the pill to expand the pin controls; tap Drop a Pin, then tap the map where you want the pin to land. A dialog asks for a short label (up to 50 characters). Confirm; the pin appears with the label.

Pinned locations behave like persistent annotations:

- Each pin is shown with its label on the map.
- A cyan dashed line connects your launch point to the most recently dropped pin, with a distance-from-launch readout beside it.
- Pins persist across sessions; they survive app restarts and carry over when you change analyses.

- The Map Pins panel lists every saved pin with rename and delete controls.
- Clear All Pins removes every pin in a single action (with a confirmation step).

P R O T I P

Use Map Pins to capture the latitude / longitude of recurring subjects (a survey marker, a recurring inspection point, the corner of a property line) so they're always one tap away on the analysis map.

Mission Analysis (RangelQ+)

8.1 What Mission Analysis Adds

RangelQ+ analyzes a specific multi-leg route rather than a radial envelope. The route can come from Litchi, DJI Pilot, or any third-party planner. Legs can vary in altitude, speed, and exposure to wind. Long missions may exceed a single battery, in which case RangelQ+ inserts a hot-swap point. The engine returns a per-leg verdict for the full route.

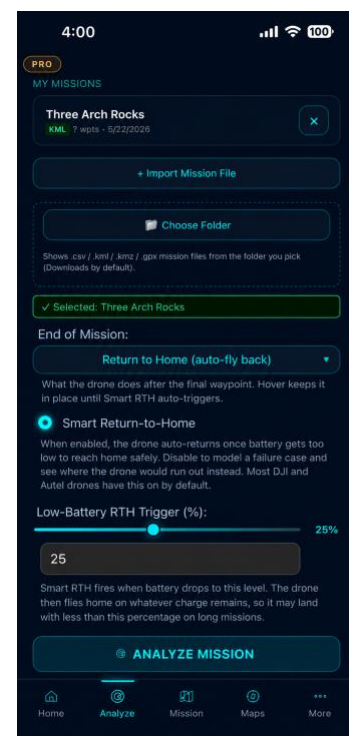
Mission Analysis is a Pro feature. It is also a server-side feature: the route is uploaded to api.noxdren.com, the analysis runs there, and the result is returned to the device. No identifying information accompanies the upload — only the route geometry, the drone profile, and the mission parameters.

8.2 Importing a Mission File

RangelQ+ ingests routes in six common formats:

- Litchi CSV — the format produced by the Litchi mission hub
- DJI WPML — the modern DJI waypoint format (used by DJI Pilot 2 and the Cloud API)
- GPX — the GPS Exchange Format used by Garmin, BasicAir, and many third-party tools
- KML — Google Earth's keyhole format
- KMZ — KML compressed; same content, smaller file
- LCHZ — Litchi's compressed bundle format including waypoints, POIs, and panorama settings

1. Switch to the Mission tab in the bottom navigation.
2. Tap Import Mission File.
3. The platform file picker opens. Navigate to the file. On iOS, RangeSight can import from Files, iCloud Drive, Dropbox, Google



Drive, or directly from email attachments via the Open in... sheet. On Android, the Storage Access Framework exposes Drive, Downloads, and any installed file managers.

4. Tap the file. RangeSight parses it on-device, validates the structure, and displays a preview with the waypoint count, total length, and bounding box.
5. Tap Use This Mission to proceed.

8.3 Running the Analysis

Once a mission is loaded, tap Analyze Mission. The route, drone profile, weather snapshot, and mission parameters are bundled into a single request and sent to the RangelQ+ server. Results typically return within two to four seconds on a reasonable cellular connection.

While the request is in flight, a progress indicator displays. If the network is unavailable, the request is queued and retried automatically when connectivity returns; you can leave the screen during the wait without losing the analysis state.

8.4 Reading the Mission Analysis Map

The Mission Analysis map renders the result as a coloured path overlaid on the satellite imagery. Each leg is rendered in one of three colours that follow the same convention as the Range Analysis rings:



L E G C O L O U R	M E A N I N G
Green	Leg is comfortably within battery margin. Aircraft will arrive at the next waypoint with reserve to spare.
Yellow	Leg is feasible but tight. Reserve at waypoint arrival will be close to your configured threshold.
Red	Leg is infeasible under the analyzed conditions. Aircraft will not reach the next waypoint with safe reserve; mission cannot be flown as planned without modification.

Numbered waypoints are marked along the path. Tapping a waypoint opens a tooltip showing the arrival battery percentage, the leg duration, the leg distance, and the dominant wind component (headwind, tailwind, or crosswind) for that segment.

8.5 The Per-Leg Breakdown Table

Below the map is a scrolling table titled LEG-BY-LEG BREAKDOWN. Each row corresponds to one leg of the mission and shows:

- Leg number (1, 2, 3, ...) and the source and destination waypoint identifiers
- Leg distance, in your selected units
- Cruise speed for the leg (taken from the mission file)
- Predicted leg duration, in seconds or minutes
- Battery consumed during the leg, in percent and amp-hours
- Battery remaining at end of leg
- Headwind/tailwind component, in m/s or mph
- Verdict — GREEN, YELLOW, or RED — matching the colour on the map

P R O T I P

If any leg is yellow or red, the table is the place to understand why. A red verdict is almost always driven by an unfavourable wind component on a long leg; you can often rescue the mission by re-ordering the legs (fly the upwind leg first, while battery is fresh) or by adding a hot-swap waypoint.

8.6 Multi-Battery Hot-Swap Planning

For missions that cannot be completed on a single battery, RangeIQ+ computes the optimal hot-swap point — the waypoint at which you should land, swap to a fresh pack, and resume. The hot-swap waypoint is marked with a blue icon containing a battery glyph ("Battery Swap") on the map and is annotated in the leg table.

Hot-swap planning takes the configured reserve threshold into account: the landing battery at the swap waypoint must be at or above the threshold (so that the aircraft can make an emergency RTH if the fresh pack is unavailable), and the resumed mission must complete with the fresh pack at or above threshold on final landing.

S A F E T Y

Hot-swap planning assumes you have one or more fully-charged spare batteries on site. RangeIQ+ does not verify your battery inventory — you must do that. If you arrive at the swap point and discover that your second pack is at 60 percent, the analysis is invalid and you should land, charge, and re-plan.

8.7 Re-Analyzing After Conditions Change

If wind, temperature, or any other condition changes between import and execution, re-analyze the mission. Tap the Refresh button at the top-right of the Mission Analysis map; the engine re-runs against the most current weather snapshot without requiring you to re-import the file.

Re-analysis is fast (typically under two seconds) and is the single most important check to perform immediately before executing a mission you planned hours earlier. A mission that analyzed green at 7 a.m. may analyze yellow or red by 10 a.m. as the wind builds.

8.8 The Mission Library (Mission Tab)

The Mission tab in the bottom navigation is the staging area for mission files. It opens to your imported missions list and exposes three controls:

- Import Mission File - opens the platform file picker. Select a single file in one of the six supported formats; the app copies it into its mission cache.
- Choose Folder - opens the folder picker. Pick a directory (for example, your Dropbox "Missions" folder or a USB drive root); RangeSight remembers the bookmark and bulk-discovers every mission file inside.
- Refresh - rescans the chosen folder. Useful after you have added new files to the folder externally.

Discovered missions appear in their own list below the imported list. Tap any mission - imported or discovered - to select it for analysis. A small badge at the top of the section shows the currently selected mission.

8.9 End-of-Mission Behavior

Below the mission list, the End of Mission dropdown controls what the engine assumes happens at the final waypoint:

O P T I O N	B E H A V I O R
Return to Home (default)	Aircraft flies back to the launch point after the last waypoint. The engine adds the return leg to the analysis; the leg table includes a final RTH row showing battery at touchdown.
Land at Last Waypoint	Aircraft touches down at the final waypoint. No RTH leg; the table shows a LAND (WP N) entry.
Hover at Last Waypoint	Aircraft holds position at the final waypoint until Smart RTH triggers. The table shows a HOVER (WP N) entry plus the eventual RTH row.

The choice materially changes the analysis. Land at Last Waypoint is the most aggressive (no return-leg budget); RTH is the safest (full return-leg budget); Hover is the most expensive (hover drain consumes battery while the aircraft stays put).

8.10 Smart Return-to-Home

Smart RTH is a checkbox below the End of Mission dropdown. When enabled (default), the engine models an automatic return to home triggered by low battery, regardless of the planned end action. The threshold slider sets the trigger level between 5 percent and 50 percent (default 25 percent).

With Smart RTH enabled, the leg table inserts an amber RTH Triggered row at the moment the simulated battery would cross the threshold. The mission then completes with the RTH leg instead of the originally planned end action.

S A F E T Y
Disabling Smart RTH models a worst-case scenario in which the aircraft attempts the full mission without low-battery intervention. The leg table will show a red CRASH / DOWN row if the simulated

battery reaches zero before the aircraft completes the planned end action. This is for planning analysis only - actual aircraft Smart RTH behavior is determined by the flight controller, not by RangeSight.

8.11 Multi-Battery (Hot-Swap) Planning

The Multi-Battery checkbox sits on the Analyze form, below the Smart RTH controls. It is off by default, deliberately. Enabling it tells the engine that you genuinely plan to land mid-mission, swap to a fresh battery, and resume. With the checkbox enabled, the engine inserts swap waypoints automatically whenever the running battery would otherwise drop below the safe-landing threshold before the mission completes.

Each swap waypoint is marked on the mission map with a swap icon and called out in the leg table with an italic "swap" badge in the leg row.

S A F E T Y

Do not enable Multi-Battery unless you actually plan to swap batteries during the operation. Hot-swap analysis assumes you have one or more fully charged spare packs on site. If you enable the checkbox out of curiosity and run a mission that depends on a swap, the aircraft will not return.

8.12 Leg-by-Leg Breakdown Table

Below the mission map, the per-leg table summarizes the analysis. The columns are:

C O L U M N	C O N T E N T S
# (leg)	Leg number with a colored dot matching the leg's color on the map. A "swap" italic badge appears here for any leg that begins with a battery swap.
Status	GREEN, YELLOW, or RED verdict for that leg, plus any leg-specific notes (e.g., infeasible_headwind, gust_exceeded).
Battery	Start and end battery percentages for the leg, displayed as "95 to 78" or similar.
Margin	How much reserve remains above the safe-landing threshold at the end of the leg.
Dist.	Leg distance in the active unit system.

Beneath any non-green leg, an inline warning list explains why the verdict is yellow or red (specific wind component, gust threshold, payload-degraded efficiency, etc.). Use the warning text to decide whether to abort the mission, change the leg order, or accept the risk with awareness.

8.13 Verdict Banner and Mission Stats

Above the Mission Analysis map, two informational strips always appear:

- Verdict banner - a colored bar showing the overall mission verdict in plain language. "Mission Complete" (green) means every leg is within margin. "Marginal" (yellow) means at least one leg is yellow but the mission completes. "Cannot Complete" (red) means at least one leg is infeasible and the mission cannot be flown as planned.
- Stats strip - six cells: Distance, Duration, Battery In, Landing, Budget, Legs. Read it left-to-right for a quick assessment before opening the leg table.

8.14 Sharing a Mission Analysis

The Share button at the top of the mission map captures the entire analysis document (verdict banner, stats strip, map, and full leg table) as a single tall PNG. The image is long; the app scrolls through the document to preheat tile rendering before stitching the capture, which takes a few seconds. When ready, the platform share sheet opens with the PNG attached.

Range Analysis sharing is simpler: it captures only the current map view, not a full document.

Offline Map Downloads

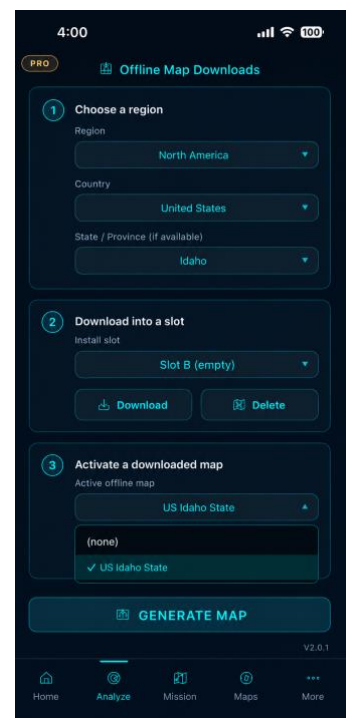
9.1 Why Use Offline Maps

Map tiles are loaded from the internet by default. This works well at home, in town, and at any site with reliable cellular coverage. It works poorly (or not at all) at remote field sites, in mountain valleys, at construction sites with cell-jamming infrastructure, or anywhere outside developed-country coverage.

RangeSight Pro lets you pre-download regions ahead of time. When you arrive at a site with no cellular signal, the offline tiles are loaded instantly from local storage; the rest of the app (GPS, analysis engine, saved missions) functions normally on the cached data.

9.2 Downloading a Region

1. From the home screen, tap the Offline Maps tile.
2. Tap Choose a Region. A list of pre-defined continental and national regions appears (North America, Europe, Australia, etc.).
3. Tap your country. A second dropdown appears with state, provincial, or regional subdivisions.
4. Tap a subdivision. The map shows the bounding box of the region; the estimated download size appears below.
5. Tap Download into a slot. RangeSight offers two slots, labeled Slot A and Slot B; each slot can hold one region, and downloading a new region into an occupied slot overwrites the previous content.



9.3 Downloading a Custom Area

Pre-defined regions are convenient but may include far more area than you need. For a specific job site or recurring flight area, use the Custom Area selector to download exactly the bounding box that matters.

1. From the Offline Maps screen, tap Choose Custom Area.

2. The map opens in selection mode. Drag the corners of the on-screen rectangle to enclose your area of interest. The size estimate updates in real time.
3. Tap Download Selection. The download begins in the background; a progress bar appears at the top of the screen.
4. When the download completes, the area is automatically loaded as the active offline map for that session.

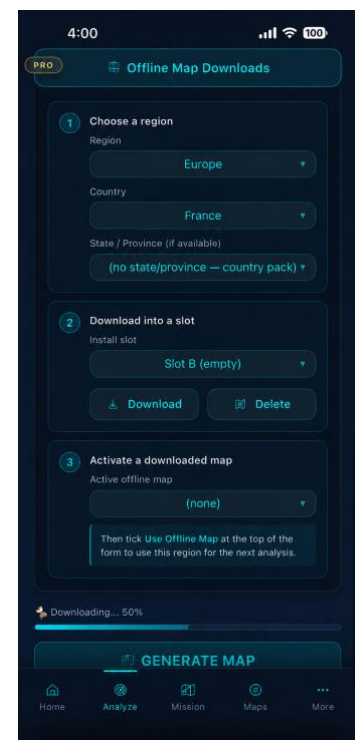
P R O T I P

Most operational flight sites are smaller than 50 km × 50 km. A tightly-cropped custom area is typically 20–60 MB; an entire continental subdivision (a US state, a European country region) is typically 100–500 MB. Use custom areas for the sites you actually fly; use pre-defined regions when you need broad coverage for travel or contingency.

9.4 Managing Saved Map Packs

All downloaded regions and custom areas are listed in the Offline Maps screen. For each entry, RangeSight shows the name, the bounding box, the storage size, the download date, and a status indicator (active / inactive / corrupted).

Use the Activate button to switch the active offline map; only one map is active at a time, and the active map is the one served to the Range Analysis and Mission Analysis maps when offline. Use the Delete button to free storage; deletion is permanent and requires re-downloading if you need the area again.



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P L A T F O R M N O T E

Offline tiles are stored in the app's private storage area: iOS: Documents/tiles. Android: files/MapTiles. The data is not accessible to other apps, is not backed up to iCloud or Google Drive, and is removed when the app is uninstalled. Plan your re-download time accordingly when migrating to a new device.

9.5 Custom Area Selector

Custom Area is a separate workflow from the preset regions. Pick it from the Maps tab; the screen replaces the map with a selection view, and a helper at the top tells you what to do.

1. From the Maps tab, tap Custom area. A full-screen map view opens with the helper text "Tap two corners on the map to define the area."
2. Pan and zoom to the area of interest.
3. Tap the first corner of your bounding box. A small pin appears.
4. Tap the opposite corner. The bounding rectangle draws between the two points.
5. Confirm the area; an estimated download size appears.
6. Tap Download. The download starts in the background.

P R O T I P

Tap a third point on the map to reset the rectangle and start over. You can re-tap as many times as needed before confirming the download.

9.6 Active Offline Map

Setting the active offline map is a two-step process. First, choose the map from the Active offline map dropdown in the Maps tab. This tells the app which downloaded pack to use. Second, tick Use Offline Map at the top of the Analyze form so the next analysis is routed through the cached tiles.

I M P O R T A N T

An active offline map without Use Offline Map ticked has no effect on the analysis. Conversely, ticking Use Offline Map with no active map produces empty tiles. Both must be set.

9.7 Manage Storage

Manage Storage opens a sub-screen listing every downloaded region (preset and custom). For each region the row shows:

- Region name (e.g., "Oregon", "Ireland", "Custom area 44.5N -123.2W")
- Storage usage in megabytes
- Tile count
- [CUSTOM] tag for user-defined areas
- Individual Delete button (two-step: tap once to arm, tap again to confirm)

At the bottom of the screen, a Delete all maps button removes every downloaded pack in a single action (same two-step confirmation). A Refresh button re-reads the filesystem in case something changed externally.

P R O T I P

Use Manage Storage to free space before a long trip when you need to swap one region for another. Most preset regions are in the 100 to 500 MB range; tightly cropped custom areas are often under 50 MB.

9.8 Download Progress

While a region or custom area is downloading, a floating widget appears at the bottom of the screen. It shows the region name, a tile-count progress indicator ("3,142 / 8,710 tiles"), a progress bar, and a Cancel button.

Downloads continue in the background while you use other parts of the app. The widget turns green briefly on success and red on failure. Tapping Cancel during a download stops the transfer and removes any partial files.

RangeSight Pro Subscription

10.1 What Pro Unlocks

The free tier of RangeSight provides RangeIQ point-to-point range analysis with the built-in drone library, manual weather entry, and online-only mapping. This is enough for casual planning and for evaluating whether the app's approach matches your operational style.

RangeSight Pro adds the operationally important features:

- RangeIQ+ multi-leg mission analysis with file import (KML, KMZ, GPX, CSV, WPML, LCHZ)
- Live weather including OpenWeatherMap and Personal Weather Station integration
- Offline map downloads for region-based and custom-area packs
- Advanced Fine-Tuning — calibrate the drone profile to your specific aircraft using one observed flight
- Custom Drone Builder (Simple and Advanced modes, six templates for common airframes) for non-mainstream platforms
- Payload weight modelling in the analysis engine
- Waypoint-level battery and return-margin breakdowns
- Smart return-to-home prediction with wind-aware modelling
- Multi-battery hot-swap planning for missions exceeding a single pack

10.2 Subscription Tiers

RangeSight Pro is available on two recurring tiers:

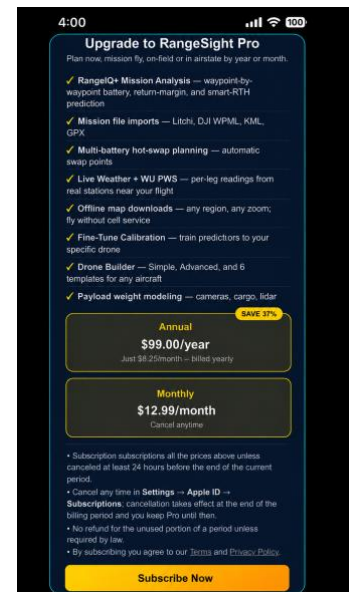
T I E R	P R I C E
Monthly	\$12.99 USD per month, billed monthly
Annual	\$99 USD per year, billed annually (effective price: \$8.25 per month — save 37 percent)

Prices in your local currency are determined by the App Store / Google Play storefront and are shown on the upgrade modal at the point of purchase. Both tiers unlock identical functionality; the annual tier is simply cheaper per month with a longer commitment.

10.3 The 14-Day Free Trial

All new subscribers receive a 14-day free trial. The trial is available exactly once per Apple ID (iOS) or Google account (Android) per subscription group; existing or former subscribers are not eligible.

During the trial, all Pro features are fully unlocked. At the end of the 14 days, the subscription automatically converts to a paid tier unless you cancel beforehand. Cancellation during the trial is straightforward and does not incur a charge.



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I M P O R T A N T

If the upgrade modal does not display the trial banner ("★ 2 weeks free") when you open it, the device's account has been marked ineligible by Apple or Google, typically because the account previously subscribed and then cancelled, or because the trial has already been redeemed. This is enforced at the platform level; RangeSight cannot override it.

10.4 Subscribing

1. Open the hamburger menu (☰) and tap Upgrade to Pro.
2. Review the feature list and pricing. Confirm that the 14-day trial pill is shown (if you are eligible).
3. Tap your preferred tier (Monthly or Annual). The platform purchase sheet appears.
4. Authenticate with Face ID, Touch ID, your Apple ID password, or Google account credentials. The subscription is activated immediately.
5. The upgrade modal closes and a small PRO badge appears in the top-left top-left corner of the home screen, replacing the analytics chip.

10.5 Managing Your Subscription

There are two ways to manage your subscription: through the upgrade modal inside RangeSight (recommended), or through your platform account settings. The in-app method opens the same platform sheet but without requiring you to leave the app.

IN - APP (R E C O M M E N D E D)

Open the upgrade modal (☰ ▶ Upgrade to Pro) and tap Manage subscription below the subscribe button. The platform's native subscription sheet opens directly inside RangeSight. From the sheet you can change tier, cancel, or check the renewal date.

T H R O U G H P L A T F O R M S E T T I N G S

P L A T F O R M N O T E

iOS: Settings ▶ Apple ID ▶ Subscriptions ▶ RangeSight Pro. Android: Google Play Store ▶ Profile (top-right) ▶ Payments and subscriptions ▶ Subscriptions ▶ RangeSight Pro.

10.6 Restoring Purchases After Reinstall

If you reinstall RangeSight, switch devices, or restore from backup, your Pro subscription is not automatically re-activated until you tap Restore existing purchase in the upgrade modal. Open ☰ ▶ Upgrade to Pro and tap Restore existing purchase; the platform validates the receipt and re-activates the subscription. This is also the right place to tap if Pro features are missing after a reinstall.

P R O T I P

Restore existing purchase queries Apple or Google for your account's active subscriptions; you must be signed in to the same Apple ID or Google account that was used at the time of purchase. Subscriptions are not transferable between accounts.

10.7 Redeem Code

Settings > Pro Access > Redeem Code accepts two kinds of codes:

- App Store / Play promotional codes - taps trigger the platform's native redemption sheet. Enter the code Apple or Google gave you and the subscription activates as if you had purchased it normally.
- Noxdren beta or lifetime codes - the same Redeem Code button also presents a text-entry alert. Type the alphanumeric code Noxdren issued and tap Redeem. The app contacts api.noxdren.com to validate; on success, Pro features unlock permanently for that device.

Noxdren codes are typically issued to early access participants, professional partners, or community contributors. They are non-transferable; the activation is tied to the device that redeems them.

I M P O R T A N T

Pro Access activated via a Noxdren code does not appear in your App Store or Play subscription list because no purchase was made. Restore Purchases will not retrieve a Noxdren code; you would need to re-enter it on a new device.

Settings and Preferences

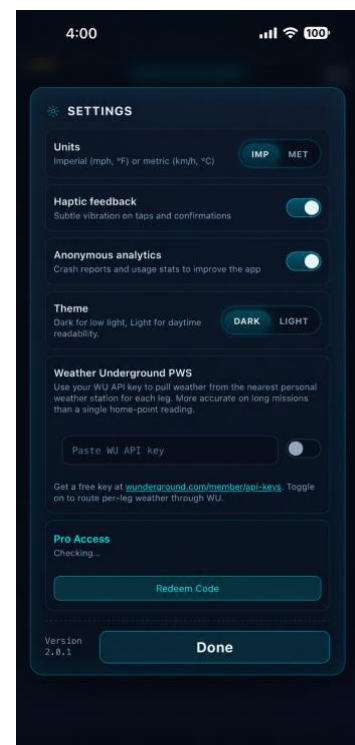
11.1 Opening Settings

Settings live in the hamburger menu: tap the menu button (top-right of the home screen), then Settings. The modal opens with six controls. Changes take effect immediately; there is no Apply or Save button.

11.2 Units

Switches the app between Imperial and Metric. Imperial reports speeds in mph, distances in feet and miles, and temperatures in Fahrenheit. Metric uses m/s and km/h, meters and kilometers, and Celsius.

The default follows your operating-system regional setting on first launch. Once you override it in Settings, your choice persists across launches and applies throughout the app, including any open analysis results.



F I G - 2 0

P R O T I P

Imported mission files preserve their original units. RangeSight converts at display time only. A Litchi mission authored in meters still imports cleanly when the app is set to imperial; the underlying coordinates and altitudes are unchanged.

11.3 Haptic Feedback

Enables or disables the subtle vibration the app uses to confirm key actions: mode switches, successful saves, analysis completion. Has no effect on devices without a Taptic Engine.

11.4 Anonymous Analytics

Controls whether RangeSight sends anonymous app-usage events to Google Firebase. The events describe app behavior in aggregate form ("user opened the upgrade modal", "user imported a mission file"). No flight content, no coordinates, no personally identifying information is transmitted.

Leave it on if you are comfortable with the trade. The data helps Noxdren prioritize features and triage crashes. Turn it off if you prefer to opt out; the change is honored immediately and persists across launches. Crash reports are also disabled when analytics is off, so Noxdren cannot help investigate crashes you encounter unless you can provide a reproducer.

I M P O R T A N T

RangeSight does not collect flight data, mission contents, coordinates, or any user-identifying information regardless of the analytics setting. The setting controls only whether application-event telemetry is transmitted in aggregate form.

11.5 Theme

Switches between Dark (default) and Light themes. There is no "Follow System" option; the choice you make in Settings applies until you change it again.

Dark is recommended for field operation. The lower luminance preserves night vision and is more legible in direct sunlight under a hand-shade. Light is useful indoors at the planning stage or when sharing the screen with a client.

11.6 Hyperlocal Weather (Optional)

Toggles hyperlocal weather: live readings from nearby personal weather stations, in addition to the default OpenWeatherMap-sourced feed. When enabled, RangeSight uses your Weather Underground API key to fetch readings from stations within range of your flight area; the closest valid station takes precedence over the synoptic feed.

S T E P 1 : G E T Y O U R W E A T H E R U N D E R G R O U N D A P I K E Y

Sign in or register for a free Weather Underground account at wunderground.com. From your account, open Member ► My Profile ► API Keys, and create a new key. Copy the key string. You may need to register a personal weather station first, depending on Weather Underground's current account requirements.

STEP 2: ENTER THE KEY IN RANGE SIGHT

1. Open Settings (☰ ► Settings).
2. Scroll to the Hyperlocal Weather row.
3. Paste your Weather Underground API key into the API Key field.
4. Toggle the switch on.

Your Weather Underground API key is stored only on your device. It is sent directly from your device to Weather Underground's servers to retrieve readings; it is not transmitted to Noxdren and is removed when the app is uninstalled. If the key is invalid or absent when the toggle is on, lookups silently fall back to OpenWeatherMap with no error shown.

PLATFORM NOTE

Hyperlocal weather lookups are a Pro feature. The toggle is visible to all users; on the free tier it has no effect.

See section 6.3 for the operational details of hyperlocal weather, including how station readings are attributed on the flight-planning screen.

11.7 Pro Access

Shows the current subscription state. Subscribers see an indicator that Pro is active, plus the option to redeem a Pro code (for example a beta-tester or promotional code issued by Noxdren). Non-subscribers see an Upgrade button that opens the subscription modal.

Storage management lives in the Offline Maps screen, not in Settings. To review and clear downloaded map tiles, open Maps from the bottom navigation and tap Manage Storage.

Troubleshooting

12.1 General Approach

When the app misbehaves, three steps resolve roughly ninety percent of issues:

1. Force-quit and reopen the application. On iOS, double-tap the home indicator (or home button on older devices), swipe up on the RangeSight card. On Android, tap the multitask button (or swipe up and hold), swipe the card aside.
2. If the issue persists, restart the device. Apple and Google's memory-management systems occasionally hold onto stale state that a force-quit alone does not clear.
3. If the issue still persists after restart, uninstall and reinstall the application. You will lose locally-stored data (saved locations, custom drones, calibrations); your subscription is preserved by Apple or Google and can be restored from the upgrade modal via Restore existing purchase.

P R O T I P

Before any of the above, note exactly what you were doing when the issue occurred. "It crashes when I tap Analyze Mission with the Mavic 3 selected and a 12-waypoint Litchi file imported" is a reproducer; "it doesn't work" is not. The first form lets us fix the issue in a single update; the second form requires guessing.

12.2 GPS Not Working

If Use GPS Location does not populate the coordinate fields, or populates them with obviously wrong values:

- Verify the device has location services enabled at the system level (iOS: Settings ▶ Privacy & Security ▶ Location Services; Android: Settings ▶ Location)
- Verify that RangeSight has location permission granted (iOS: Settings ▶ Privacy & Security ▶ Location Services ▶ RangeSight; Android: Settings ▶ Apps ▶ RangeSight ▶ Permissions)
- Move outdoors with a clear view of the sky and wait 30 seconds for a fresh fix

- Toggle airplane mode on for five seconds and then off, which resets the GPS subsystem on most modern devices
- If the issue persists in clear sky outdoors, restart the device (the GPS hardware initialisation occasionally fails and a full reboot is the only reliable reset)

12.3 Weather Data Unavailable

If the live weather panel fails to populate:

- Check internet connectivity. Open a web page in your phone's browser to confirm
- Re-fetch by toggling Use Live Weather off and back on
- If your home coordinate is outside OpenWeatherMap's coverage area (rare — mid-ocean, deep Arctic, deep Antarctic), no fetch will succeed; use manual entry
- If you are a Pro subscriber and hyperlocal-weather lookup fails specifically, verify that your Weather Underground API key is correct, that your Weather Underground account is in good standing, and that personal weather stations exist within range of your flight area. RangeSight does not control Weather Underground service status

12.4 Mission Analysis Returns an Error

If Analyze Mission returns a server error:

- Confirm the imported file parsed correctly. The preview screen should show a non-zero waypoint count and a sensible bounding box. If the preview is empty, the file is malformed
- Re-export the mission from your authoring tool to a different format (e.g., if Litchi CSV fails, export as KML)
- Check internet connectivity; RangeIQ+ requires a network round trip
- Verify your subscription is active (☰ ► Upgrade to Pro — should show "You are subscribed" rather than the upgrade tiers)
- If all of the above check out and the error persists, contact support@noxdren.com with the error code shown on the screen and a description of the mission file

12.5 Subscription Not Activating

If you have subscribed but Pro features are still locked:

- Wait sixty seconds. Purchase confirmation can be delayed under heavy load at Apple or Google
- Open the upgrade modal (☰ ► Upgrade to Pro) and tap "Restore existing purchase" under the subscription tiles. This forces the app to re-query your account's active subscriptions

- Verify you are signed in to the same Apple ID or Google account used at the time of purchase. Subscriptions are not transferable between accounts
- Open the App Store or Google Play app, open Subscriptions, and confirm the RangeSight Pro subscription shows as Active. If it shows as Expired or Pending Approval, the issue is at the platform level rather than within RangeSight

12.6 Offline Map Download Fails

If a region or custom area download fails:

- Verify available device storage. Large regions can require 300 MB or more; the download will fail if the device is full
- Check internet connectivity — downloads are paused (not retried indefinitely) on network failure
- If the download appears to complete but the active map shows blank tiles, tap Delete on that pack and re-download. Corruption mid-download is rare but does occur with flaky cellular connections
- If the issue persists, the chosen region may be temporarily unavailable from the upstream tile provider. Try a different region as a control test

Safety and Best Practices

13.1 RangeSight Is a Planning Aid, Not a Safety System

S A F E T Y

Read this section in full before relying on any RangeSight output for a flight. The remainder of the chapter explains, in detail, why this distinction matters operationally.

RangeSight is a planning aid. It calculates the most likely outcome from the parameters you provide; it cannot guarantee the flight will execute as planned. A correct analysis is one input into a layered safety process, not a replacement for the other layers.

The layers that RangeSight does not replace include, at minimum:

- Pilot certification and training appropriate to the operation, jurisdiction, and aircraft
- Pre-flight aircraft inspection and airworthiness verification
- Pre-flight environment assessment (weather observation, airspace check, NOTAM check, TFR check, local-ordinance check)
- Real-time situational awareness during flight, including manual control capability at all times
- Post-flight review and adjustment of plans based on observed discrepancies between the plan and reality

13.2 Pre-Flight Checklist Recommendations

Below is a non-exhaustive pre-flight checklist that RangeSight is designed to support but never replace. Adapt it to your specific aircraft, operation, and jurisdiction.

1. Verify aircraft airworthiness (props secure, batteries within voltage tolerance, propellers undamaged, gimbal free, firmware current)
2. Verify pilot certification appropriate to the operation (Part 107 currency for US commercial, A2 CofC for EU, etc.)

3. Confirm airspace classification and authorisation requirements (LAANC submission for US controlled airspace, U-space compliance for EU, etc.)
4. Check NOTAMs and TFRs for the operating area
5. Observe current weather at the site (handheld anemometer reading, visible cloud base, precipitation in the area)
6. Run RangeSight analysis with current site weather (RangeIQ for point-to-point; RangeIQ+ for multi-leg)
7. Confirm the analysis returns green (or yellow with explicit acceptance of marginal risk)
8. Brief the operation to crew, ground observers, and any required stakeholders
9. Execute the flight with continuous monitoring of telemetry and environment

13.3 When to Distrust the Analysis

Distrust the analysis (and re-verify or abort) whenever any of the following are true:

- Conditions on the ground differ materially from the conditions RangeSight fetched (e.g., the live weather pulled 14 m/s winds but you can directly observe trees and your own windsock indicating significantly more)
- Time between analysis and execution exceeds 30 minutes; re-analyze immediately before launch
- The aircraft has been modified (props, batteries, payload, firmware) since the last calibration
- Your selected drone profile is generic or untuned (no Five Tuna calibration applied)
- The mission is at the edge of the safe envelope (yellow rings or yellow legs). Flying yellow is not flying green; it is deliberately accepting a thinner margin
- You are operating in conditions outside the profile's validation envelope (extreme cold below -10°C, extreme altitude above 4,000 m, very high humidity in heavy rain)

13.4 Legal and Regulatory Compliance

You are solely responsible for knowing and complying with all applicable drone laws and regulations in your jurisdiction. RangeSight does not enforce, validate, or track regulatory compliance; it is a flight-planning tool, not a compliance system. Specific obligations vary substantially by jurisdiction:

J U R I S D I C T I O N	P R I M A R Y R E G U L A T O R Y F R A M E W O R K
United States	FAA Part 107 (commercial), Part 89 (Remote ID), recreational rules under 49 USC 44809, LAANC for controlled airspace, TRUST test for recreational pilots
European Union	EASA Open category, Specific category with operational authorisation, Certified category; national aviation authority registration
United Kingdom	CAA Open/Specific/Certified; flyer ID and operator ID registration
Canada	Transport Canada Basic and Advanced operations; drone pilot certificate
Australia	CASA RePL and ReOC; sub-2 kg micro category with limited authorisation
Japan	MLIT registration and licensing under amended Civil Aeronautics Act
Other jurisdictions	Consult your national aviation authority. Regulations are evolving rapidly and vary considerably between countries

S A F E T Y

Regulations change frequently and may differ significantly within a single country (e.g., US state and municipal ordinances restricting drone operations beyond federal rules). Always verify current requirements with the appropriate authority before flying in unfamiliar locations or for unfamiliar operations.

Support and Contact

14.1 General Support

For technical support, feature requests, and general product questions:

I M P O R T A N T

Email: support@noxdren.com

Website: <https://rangesight.io>

Manual: <https://rangesight.io/manual.html>

Support is provided in English. Responses are typically within one to three business days. Please include the following in any support email: device model, operating system version, RangeSight version (visible at the bottom of the home screen), and a clear description of the issue including reproduction steps.

14.2 Privacy and Data-Subject Requests

For privacy-related questions, GDPR or CCPA data-subject requests, or opt-out questions beyond the in-app Anonymous Analytics toggle:

I M P O R T A N T

Email: privacy@noxdren.com

Privacy requests will be acknowledged within five business days and substantively addressed within thirty calendar days as required by the applicable regulation.

14.3 Legal Inquiries

For legal notices, intellectual-property disputes, indemnification claims, and contract questions:

I M P O R T A N T

Email: legal@noxdren.com

Postal: Noxdren, LLC, Louisville, Kentucky, USA

Legal correspondence should be sent through legal counsel where appropriate. Casual support questions sent to legal@noxdren.com will be redirected to support@noxdren.com.

14.4 About Noxdren, LLC

Noxdren, LLC is a Kentucky limited-liability company headquartered in Louisville, Kentucky, United States. The company develops professional-grade tools for the unmanned aviation industry. RangeSight is its flagship product.

The company name is the operative legal entity for all commercial and contractual matters; RangeSight®, RangeIQ™, and RangeIQ+™ are product and feature trademarks of Noxdren, LLC.

14.5 Social Channels

The in-app Contact modal (☰ ► Contact) lists current Noxdren social channels for product news and informal questions: Facebook, X (formerly Twitter), and Instagram. The handles displayed in-app are the canonical references; the platform handles can change over time.

Social-channel questions receive a best-effort response. They are not a substitute for email support when you need an issue tracked.

Legal Notices

15.1 Overview

This chapter summarises the legal agreements governing your use of RangeSight. The full text of each agreement is available within the application at any time (hamburger menu ☰ ▶ Terms of Service / Privacy Policy / Disclaimer) and on the Noxdren website at <https://rangesight.io>.

I M P O R T A N T

The summaries in this chapter are provided for convenient reference and orientation only. They are not the binding agreements. The full in-app and on-website documents are the controlling versions for legal purposes. In the event of any conflict between this summary and the full text, the full text governs.

15.2 Terms of Service — Summary

By using RangeSight, you enter into a binding agreement with Noxdren, LLC. Key points:

- You are granted a limited, non-exclusive, non-transferable, revocable license to use the App on devices you own or control, for personal or commercial planning purposes, subject to compliance with all applicable laws
- You may not reverse-engineer, redistribute, sublicense, or use the App to develop competing products
- You bear sole responsibility for compliance with aviation regulations, for safe operation, and for all flight decisions
- The App is provided AS IS without warranties of any kind
- Liability is limited to the maximum extent permitted by applicable law
- Governing law: State of Kentucky, United States. Disputes are resolved through informal contact first, then binding arbitration under American Arbitration Association rules in Jefferson County, Kentucky, with a class-action waiver

15.3 Privacy Policy — Summary

Noxdren, LLC respects your privacy. Key points:

- RangeSight processes most data locally on your device; flight plans, saved locations, and mission files do not leave the device unless explicitly transmitted (e.g., RangelQ+ mission analysis sends route geometry to the analysis server)
- Location data is processed on-device and not transmitted to Noxdren servers
- Anonymous, aggregated usage events and crash reports are sent to Google Firebase to help improve the App; flight content, coordinates, and personal identifiers are never sent
- You can opt out of analytics at any time via the in-app setting
- RangeSight does not sell, rent, or trade personal data to third parties for marketing purposes
- GDPR rights (access, rectification, erasure, portability, objection, restriction, complaint to supervisory authority) and CCPA rights (know, delete, opt-out of sale, non-discrimination) are honoured through privacy@noxdren.com
- The App is not intended for children under 13 (or 16 in the EEA)

15.4 Disclaimer — Summary

S A F E T Y

RangeSight, RangelQ™, and RangelQ+™ are provided AS IS without any warranties, express or implied. You assume full and complete responsibility for all risks associated with drone operation, including compliance with regulations, airworthiness, weather assessment, and flight decisions. RangeSight is a planning aid only and does not replace pilot judgment, training, certification, or real-time situational awareness. To the maximum extent permitted by applicable law, Noxdren, LLC is not liable for any damages arising from your use of the App, including but not limited to equipment loss, personal injury, property damage, regulatory penalties, or third-party claims.

Key disclaimer points expanded:

- No guarantee of accuracy. Actual flight performance varies with weather, battery health, payload, aircraft condition, pilot technique, and other factors.
- Assumption of risk. You are solely responsible for compliance, inspection, weather assessment, airspace authorization, collision avoidance, and emergency procedures.
- Limitation of liability. To the maximum extent permitted by law, Noxdren, LLC is not liable for direct, indirect, incidental, consequential, special, or punitive damages of any kind.
- Indemnification. You agree to indemnify, defend, and hold harmless Noxdren, LLC from claims arising from your operations.

- Regulatory compliance. You are solely responsible for knowing and complying with all applicable aviation laws in your jurisdiction.
- Not professional advice. RangeSight does not provide professional aviation consulting, certified meteorological services, legal advice, or safety certification.
- No manufacturer affiliation. RangeSight is an independent third-party application not affiliated with DJI, Autel Robotics, Skydio, Parrot, or any other drone manufacturer.

15.5 Contact for Legal Matters

All legal correspondence should be directed to legal@noxdren.com. The Noxdren, LLC corporate address is Louisville, Kentucky, United States; physical correspondence may be requested by email.

Supported Drone Profiles

The built-in drone library covers 31 aircraft as of RangeSight version 2.0.2. New profiles arrive with most releases; the in-app drone dropdown is always the definitive list.

AUTEL ROBOTICS (4)

- Autel EVO Lite+
- Autel EVO Nano
- Autel EVO Nano+
- Autel EVO II Pro V3

DJI (23)

- DJI Mini 2
- DJI Mini 2 SE
- DJI Mini 3
- DJI Mini 3 Pro
- DJI Mini 4 Pro
- DJI Mavic Mini
- DJI Mavic Pro
- DJI Mavic Air
- DJI Mavic Air 2
- DJI Mavic 2 Pro
- DJI Mavic 2 Zoom
- DJI Mavic 3
- DJI Mavic 3 Classic
- DJI Mavic 3 Pro
- DJI Air 2S
- DJI Air 3
- DJI Avata
- DJI Avata 2
- DJI FPV

- DJI Phantom 4 Pro V2.0
- DJI Inspire 3
- DJI Matrice 30
- DJI Matrice 300 RTK

F R E E F L Y S Y S T E M S (1)

- Freefly Alta X

P A R R O T (2)

- Parrot ANAFI
- Parrot ANAFI Ai

S K Y D I O (1)

- Skydio 2+

If your aircraft is not on this list, use the Custom Drone Builder (Chapter 3.3) to author a profile.

Mission File Formats

RangeIQ+ accepts six mission file formats. The parser is permissive where the spec allows, but a malformed file will be rejected at import time with a clear error message. The minimum required fields for each format are summarised below.

L I T C H I C S V

Comma-separated values as exported by the Litchi mission hub. Required columns:

- latitude (decimal degrees)
- longitude (decimal degrees)
- altitude(m) (above ground, metres)
- heading(deg) (yaw at waypoint)
- curvesize(m) (turn radius)
- rotationdir (turn direction)
- gimbalmode, gimbalpitchangle
- actiontype1 ... actiontype15 (waypoint actions; analyzed for hover/photo durations)
- altitudemode (0 = AGL, 1 = MSL)
- speed(m/s) (per-leg cruise speed)

D J I W P M L

DJI's modern XML-based waypoint format, used by DJI Pilot 2 and the Mission Cloud API. The full WPML spec is supported including global wayline configuration, per-waypoint actions, payload configuration, and broken-execution recovery hints. WPML files may be packaged as plain XML (.wpml) or as a compressed directory bundle (.kmz containing waylines.wpml).

G P X

The GPS Exchange Format from topografix.com. Both track and route encodings are accepted:

- trk/trkseg/trkpt — for recorded GPS tracks
- rte/rtept — for authored routes
- wpt — for individual waypoints (treated as a single-waypoint route)

Altitude (ele element) is interpreted as MSL by default; the parser checks for the geoidheight extension to convert to ellipsoidal where present.

K M L / K M Z

Google Earth's keyhole format. Supported geometries: Placemark, LineString, MultiGeometry.

Coordinates may be in two-tuple (longitude,latitude) or three-tuple (longitude,latitude,altitude) form.

KMZ files are KML compressed into a ZIP archive; the parser extracts doc.kml from the archive root and ignores any other contents (icons, overlays, etc.).

L C H Z

Litchi's compressed mission bundle. Internally a ZIP archive containing the mission CSV plus any associated panorama, points-of-interest, and metadata. The parser extracts the mission CSV and processes it identically to the Litchi CSV path above.

P R O T I P

If your authoring tool produces a format not listed here, GPX is the most widely-supported export option and works as a lowest-common-denominator. Almost every drone mission planner offers GPX export.

Glossary

Definitions of terms used in this manual and within the RangeSight application. Where a term has a specific aviation regulatory meaning that may differ from common usage, the regulatory meaning is given.

AGL Above Ground Level. Altitude measured from the surface directly below the aircraft.

BVLOS Beyond Visual Line of Sight. Drone operations where the pilot in command cannot directly see the aircraft. Requires specific waiver in most jurisdictions.

Advanced Fine-Tuning RangeSight's per-aircraft calibration. Uses Starting and Landing battery percentages from one real flight to bias the engine toward your aircraft's observed performance. See Chapter 3.5.

CSV Comma-Separated Values. A text file format used by Litchi for mission export.

EASA European Union Aviation Safety Agency. Issues drone regulations covering all EU member states.

FAA Federal Aviation Administration. Issues drone regulations for the United States.

GPX GPS Exchange Format. XML-based file format for GPS routes and tracks.

Hot-swap Mid-mission battery replacement. The aircraft lands at a designated waypoint, the depleted battery is removed and a charged pack installed, and the mission resumes.

KML / KMZ Keyhole Markup Language (uncompressed) and its compressed variant. Google Earth's geographic file format.

LAANC Low Altitude Authorisation and Notification Capability. The FAA's system for near-real-time controlled-airspace authorisation for drones in the United States.

LCHZ Litchi's compressed mission bundle. ZIP archive containing the mission CSV plus associated metadata.

MSL Mean Sea Level. Altitude measured from sea level rather than the local terrain.

NOTAM Notice to Air Missions (formerly Notice to Airmen). FAA advisories regarding airspace conditions.

OpenWeatherMap Global weather data provider used by RangeSight for live weather lookups.

Part 107 Title 14 of the US Code of Federal Regulations, Part 107: the rules for small unmanned aircraft system operations.

Personal Weather Station (PWS) Privately-owned weather stations whose readings are made available through services such as Weather Underground. Personal stations update more frequently than synoptic stations and are usually closer to the operating area, which makes them useful for hyperlocal flight planning. See Chapter 6.3 for setup.

Pre-defined region A continental or national bounding-box for offline map downloads. RangeSight ships with curated regions for major geographic areas.

RangelQ™ Noxdren's on-device single-point range-analysis engine.

RangelQ+™ Noxdren's server-side multi-leg mission-analysis engine, hosted at api.noxdren.com.

Reserve threshold The battery percentage treated as the safe-landing floor. The standard 25 percent is shown as the outer green ring on the analysis map; a custom value can be set per drone via the Battery Reserve fraction field in the Custom Drone Builder, Advanced Mode.

RTH Return To Home. The automated procedure for returning the aircraft to its launch point, either pilot-commanded or automatic (low-battery, signal-loss, etc.).

Safe-return ring The colour-coded concentric range circles produced by RangelQ. Each ring represents the round-trip distance at which the aircraft returns to home with the labelled battery percentage.

TFR Temporary Flight Restriction. A short-notice airspace restriction issued by aviation authorities, commonly for VIP movements, sporting events, or emergency operations.

WPML DJI Waypoint Markup Language. DJI's XML-based mission format used by DJI Pilot 2 and the Mission Cloud API.

U-space The European Union's framework for low-altitude drone airspace integration and management.

Privacy Data Inventory

RangeSight transmits a small, well-defined set of data to third-party services. This appendix lists every category, what leaves the device, what service receives it, and what permission controls it. The full privacy text is in the in-app Privacy Policy ([More > Privacy Policy](#)); this is a quick operator reference.

TRANSMITTED: LOCATION COORDINATES

Latitude and longitude (and optionally a small bounding box for offline tile fetches) are sent to: Noxdren's weather proxy at tiles.rangesight.io for live weather; tile providers for interactive map rendering; Noxdren's analysis API at api.noxdren.com when you analyze a mission. No identity is attached.

TRANSMITTED: MISSION FILE ROUTE GEOMETRY

When you analyze a Waypoint Mission, the route's waypoint coordinates and per-waypoint parameters (altitude, action type) are uploaded to api.noxdren.com. The mission name, your identity, and the source filename are NOT sent.

TRANSMITTED: ANONYMOUS APP-USAGE EVENTS

When Anonymous Analytics is on ([Settings > Anonymous analytics](#)), the app sends event names like "map_generated", "mission_imported", "purchase_initiated" to Google Firebase. The events carry no flight content, no coordinates, and no identity. Crash reports are also enabled with the same toggle.

TRANSMITTED: SUBSCRIPTION RECEIPTS

When you subscribe to RangeSight Pro, Apple or Google sends a transaction identifier to the app; the app forwards it to Noxdren's IAP verification endpoint at api.noxdren.com. No payment details ever pass through RangeSight.

STORED ON-DEVICE, NOT TRANSMITTED

- Home location coordinates (UserDefaults)
- Form preferences and per-flight values (browser local storage)
- Last 5 analysis records (browser local storage)
- Custom drone profiles (UserDefaults)

- Downloaded offline map tiles (Documents/tiles)
- Imported mission files (Documents/missions)
- Last analysis result (Documents/lastMission)
- Weather Underground API key, when entered (browser local storage; sent directly from the device to Weather Underground, never to Noxdren)
- Map pin annotations (UserDefaults)
- Selected map style preference (UserDefaults)
- Tour completion flag, What's-New seen flag (browser local storage)

All on-device data is excluded from iCloud and Google Drive backups. Uninstalling RangeSight removes everything.

Network Endpoints

RangeSight communicates with a small set of network endpoints. IT departments approving the app for fleet deployment, and users on restrictive networks, may need this list.

A P I . N O X D R E N . C O M

- POST /v1/missions/analyze - Waypoint Mission analysis. Sends route geometry and mission parameters; receives the leg-by-leg result.
- POST /v1/iap/apple/verify - Apple StoreKit receipt verification (internal handshake).
- POST /v1/beta/activate - Noxdren beta / lifetime code validation.

T I L E S . R A N G E S I G H T . I O

- GET /api/weather - Live weather proxy backed by OpenWeatherMap. Returns wind, gust, direction, temperature, humidity.
- GET /tiles/{provider}/{z}/{x}/{y}.png - Map tile fetches for online viewing and offline downloads.

R A N G E S I G H T . I O

- GET /manual.html - The hosted user manual (opened via the User Manual menu item).
- GET /privacy.html - Privacy Policy (linked from the upgrade modal).
- GET /terms.html - Terms of Service (linked from the upgrade modal).

W U N D E R G R O U N D . C O M

- GET /api/* - Personal weather station readings, called only when Pro is active and the user has supplied a valid Weather Underground API key in Settings. Requests are sent directly from the user's device to Weather Underground; the key never passes through Noxdren infrastructure.

A P P S T O R E / P L A Y S T O R E S E R V E R S

Standard StoreKit and Play Billing endpoints for subscription purchase, renewal, and restore. These are platform-managed; RangeSight does not directly access them.

GOOGLE FIREBASE (ANALYTICS, CRASHLYTICS)

Anonymous app-usage events and crash reports are sent to Google Firebase when Anonymous Analytics is on. The endpoint is firebase.logging.googleapis.com (subject to change by Google).

E N D O F M A N U A L

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RangeSight v2.0.2 · First edition, May 2026

<https://rangesight.io>