

Phase One iX-100 / IF1200A User Guide

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The following instructions are to use the Phase One iXM-100 camera on the IF1200A. Sections include physically installing the gimbal & camera on the drone, changing camera settings via MavCam, capturing images using the Herelink controller, downloading and viewing images from the camera, formatting the memory card, basic mission settings, and changing mission speed / proper photo interval speed.

1. Camera and Gimbal Installation

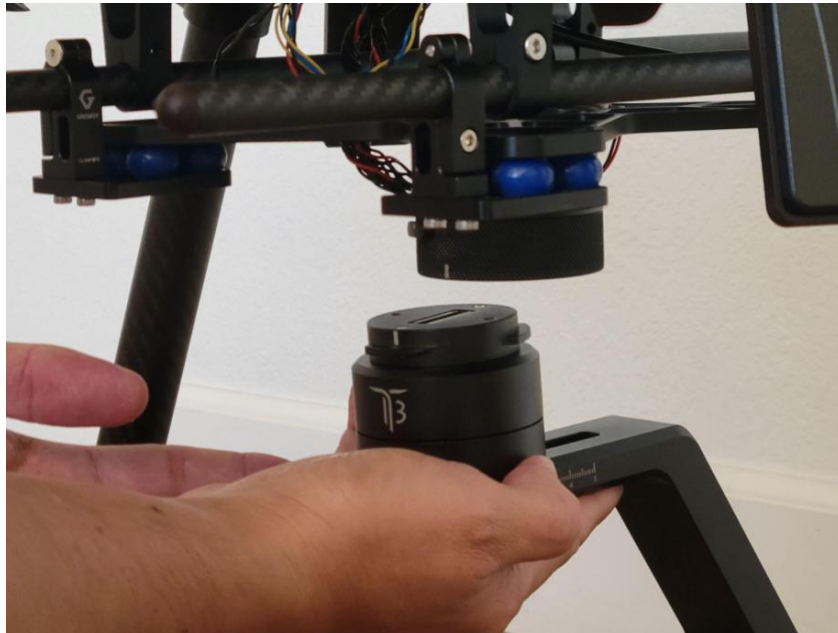
- In the case you will find the Phase One Camera and T3 Gimbal fully mounted, calibrated and wired with Air Commander on the bottom plate of the gimbal to access camera features via MavCam on the Herelink controller.



- Remove the rubber protector from the top of the gimbal. Looking down at the top of the gimbal, rotate the top of the gimbal until the white line and T3 symbol are facing forward (the direction of the camera lens).



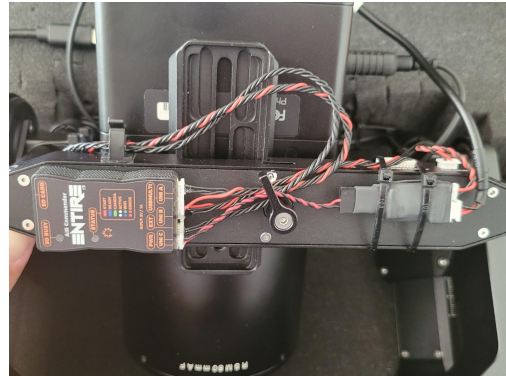
- With the gimbal centered, bring the payload to the front of the vehicle. The vehicle quick connect has a white line that will match up with the white line of the gimbal, make sure they both face towards the front of the vehicle when installing.



- Fully insert the gimbal to the quick connect mount and twist the drone side connection to the left to the lock position indicated by the lock symbol. The button will click into place and extend when the fully locked position is achieved.

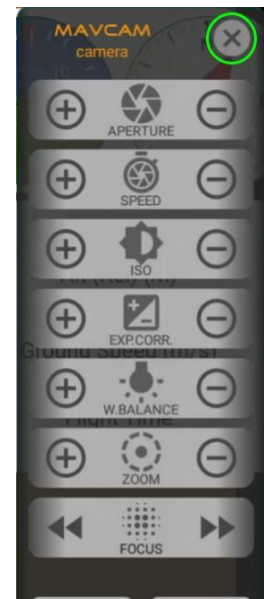
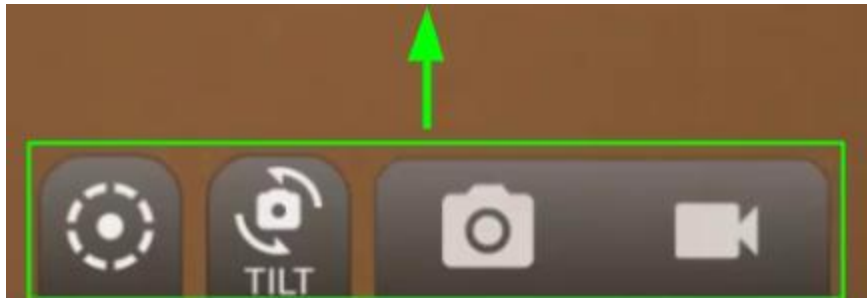


- Check to make sure all connections are securely plugged into the back of the camera and at the bottom of the gimbal below the camera.

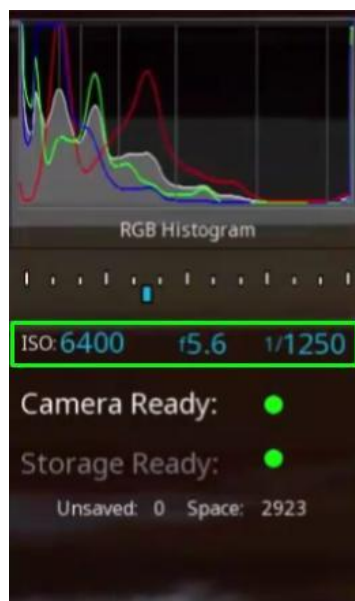


2. Controlling the Camera and Gimbal

- Power up the vehicle, and the gimbal will initialize and center itself. QGC and Mavcam will automatically open on your Herelink Controller where you will see the basic MavCam menu at the bottom of the screen. Swipe up to extend the settings menu, use the + and - icons to adjust the camera settings and click the "X" to collapse. **Note:** If MavCam does not open on startup, select the MavCam app from the home screen or app menu. Press and hold to select Enable on Boot to ensure it opens when the Herelink powers up.

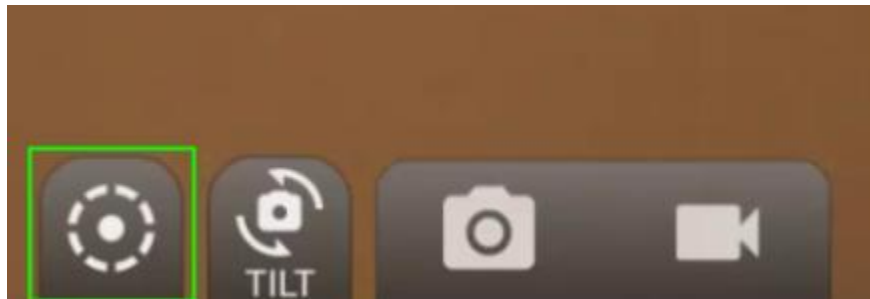


- Under the swiped up MavCam settings, the C1 button is used to control auto camera settings. You will see under the Histogram on the left side of the screen the ISO, Aperture and Shutter Speed turn blue when auto settings are enabled.

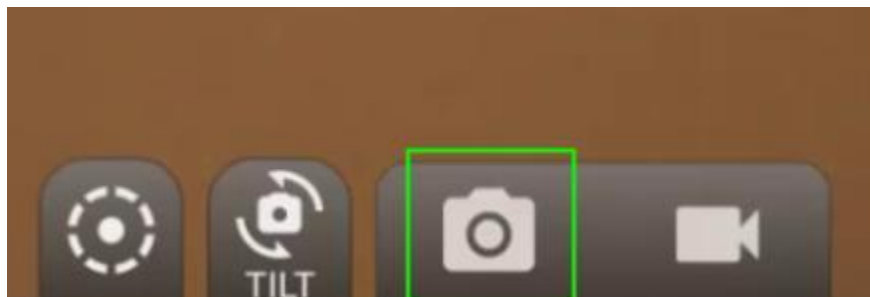


- The first icon on the left of the small MavCam menu is the Focus. Selecting it will open the focus slider, allowing you to select autofocus or manually focus the camera. **Note:** We recommend manually selecting your height value used in the

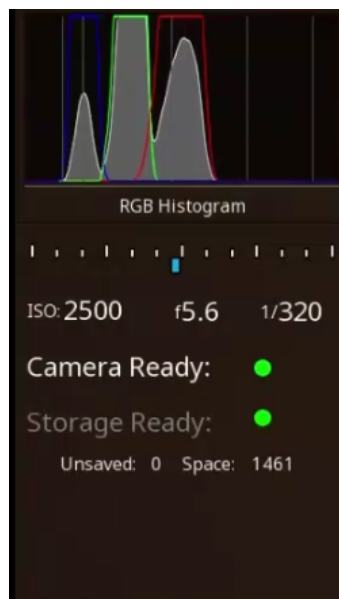
QGC mission so the camera does not have to autofocus during the mission which can negatively affect the photo interval speed it is able to achieve.



- To take a picture manually, use the MavCam photo trigger button. Photos will automatically be triggered during a mission.



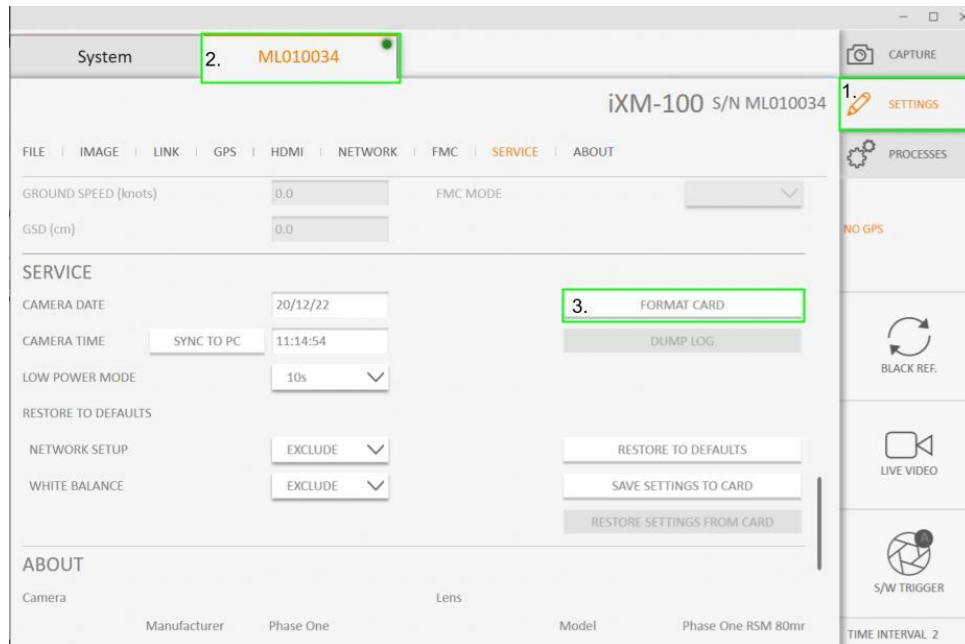
- The Histogram on the left of the camera screen will indicate your camera settings and show green lights next to camera ready and storage ready to indicate it is ready to go. If the Storage Ready indicator is red, format the memory card indicated in the following steps.



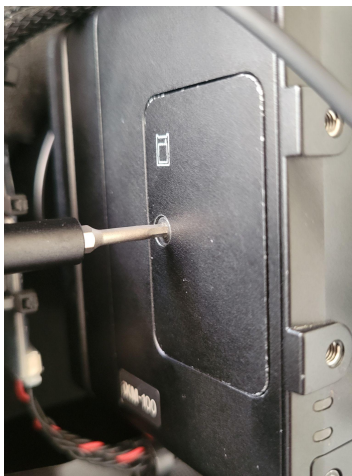
- Formatting the Memory Card is done using the iX Capture software downloaded from the [Phase One official site](https://www.phaseone.com/download-categories/geo-software/) (<https://www.phaseone.com/download-categories/geo-software/>). Locate the USB-C slot behind a panel on the back of the camera. Using a 2mm hex driver, the panel can be removed to expose the USB-C connection.



- With the vehicle and camera powered on, connect to the USB-C port using a computer with the iX Capture software. First select the settings tab, then the camera tab and scroll down until you see the Format Card option. It will only take a moment to format the card.



- To remove the memory card and download images, use a 2mm driver to open the panel on the side of the camera to expose the memory card and gently press the card to unlock and pull it free.



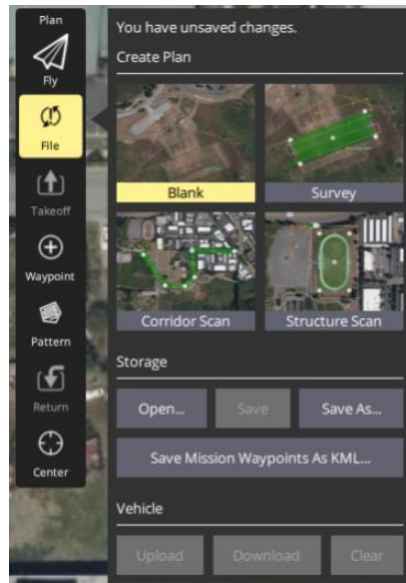
- To access the memory card and download your pictures, use the SmartQ card reader to connect to your computer via USB-C. To view and edit the .IIQ file type photos, use the [Capture One software](https://www.captureone.com/en/campaign/studio-photography) (<https://www.captureone.com/en/campaign/studio-photography>).



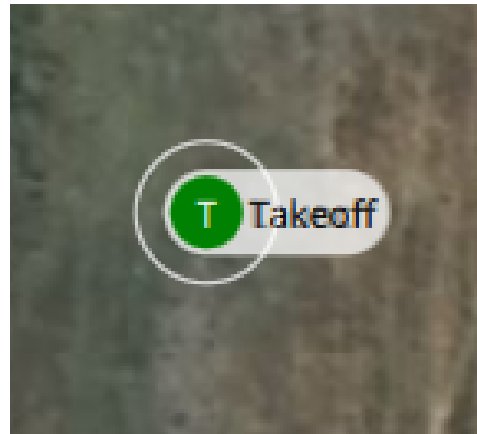
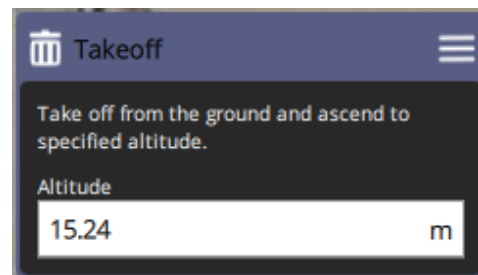
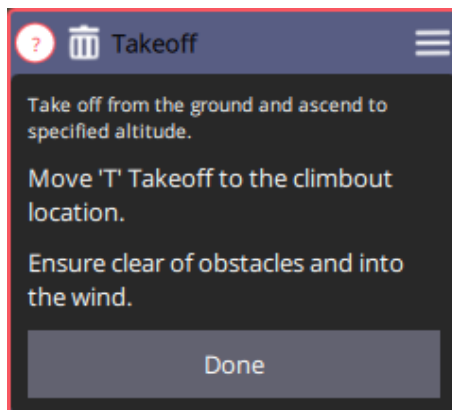
3. Mission planning

- Open QGroundControl and navigate to the Plan tab indicated by the waypoint symbol on your computer or Herelink Controller and select your desired plan type. For our sample, we used a Survey Plan.





- Start by positioning your Takeoff point to the desired location on the map and click “Done” to bring up the Altitude selection. For our sample, we used 15.24M



- On the right side of the screen find the Mission Start tab and select it to show the Vehicle Info dropdown. Under the Vehicle Info dropdown, the Hover Speed value is used as an estimate in QGC for the Total Mission Time and Photo Interval

time. Our sample is set to 4 m/s. **Note:** Hover Speed in the Mission Start section is **only used to estimate** the time of the mission and photo intervals. To adjust actual Flight Speed, we will use a waypoint as shown later in the guide. Make sure the two values match to ensure accurate mission settings are achieved.

Mission Start

All Altitudes
Relative To Launch ▾

Initial Waypoint Alt
15.2 m

Vehicle Info

Firmware ArduPilot
Vehicle Multi-Rotor

The following speed values are used to calculate total mission time. They do not affect the flight speed for the mission.

Hover speed 4.00 m/s

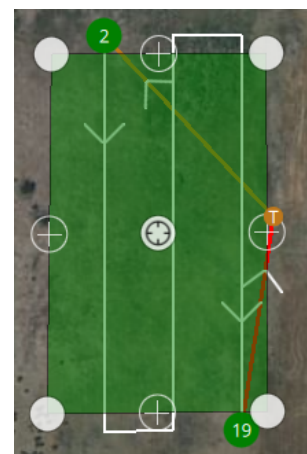
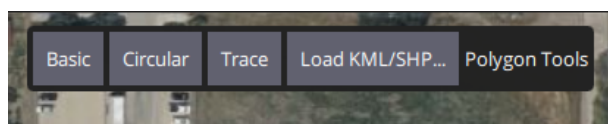
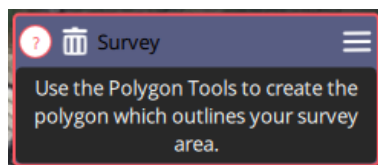
Launch Position

Altitude 41.2 m

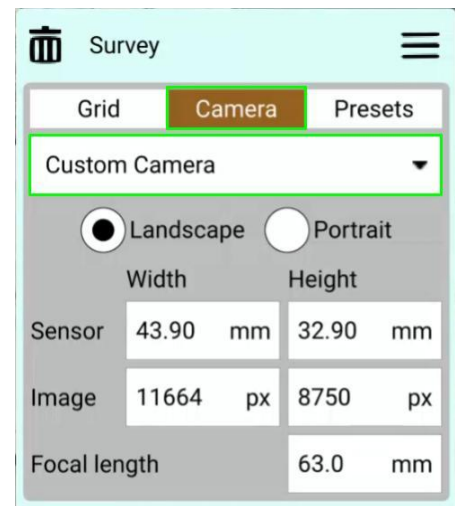
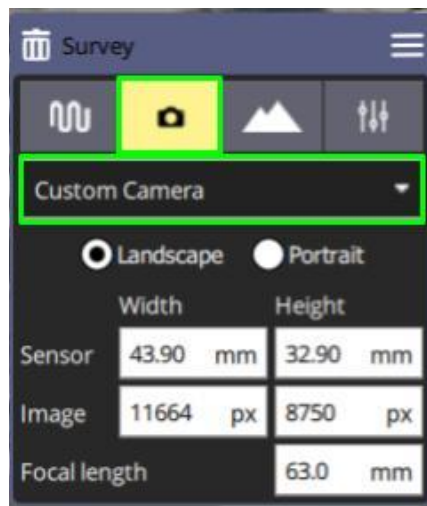
Actual position set by vehicle at flight time.

Set To Map Center

- On the right side of the screen under Takeoff, you will see the Survey tab. Select it to define your mission boundaries. Using the Polygon Tools, create your boundaries on the map. Selecting Basic will bring up a square border box and populate the Survey mission waypoints. Click and drag each corner of the boundaries to outline your mission area. Using the + icons, you can add new points to the boundary or by clicking and holding a white boundary point, you can delete a point by selecting “Remove Vertex”. When you are done the Survey tab will populate more settings.

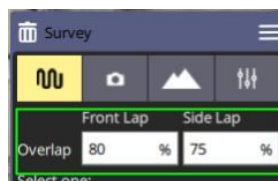


- Select the Camera page to enter Custom Camera settings from the dropdown selection. The Phase One iXM-100 Camera Specifications are
 - **Sensor Width:** 43.9mm
 - **Sensor Height:** 32.9mm
 - **Image Width:** 11664 pixels
 - **Image Height:** 8750 pixels
 - **Focal Length:** 63mm Note: It is important to calculate using the 35mm equivalent of the lens for QGC to interpret the data correctly.

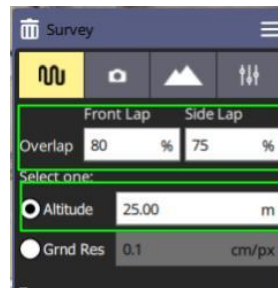


Note: Desktop visual is shown on the left, Herelink Controller visual is shown on the right.

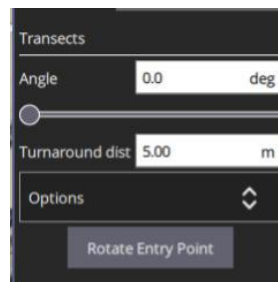
- Return to the Grid tab where you will see Overlap will set how much the photos overlap when triggered during the mission. Enter the Front and Side Overlap for your mission, our sample uses 80% Front Lap and 75% Side Lap.



- Selecting Altitude will allow you to enter a height manually or Grnd Res to automatically calculate an altitude to achieve the resolution based on your settings. For our sample, we used Altitude set at 25M.



- The transect angle allows you to adjust the orientation the vehicle will fly through the survey boundaries and turnaround distance adjusts how far beyond the edge of the survey boundaries the vehicle will travel. For our sample, we used 0 deg angle and 5M turnaround.



- Reviewing our sample settings, we have QGC outputting a 0.7 second Photo Interval. Note: Keeping the Photo Interval above 0.5 seconds will allow the camera time to keep up with the triggering events sent by QGC during the mission. **If the photo interval is too fast, the camera will stop taking photos.** Make sure the settings and mission speed allow the photo interval to remain above 0.5 seconds

Survey

Front Lap Side Lap

Overlap 80 % 75 %

Select one:

☒ Altitude 25.00 m

☐ Grnd Res 0.1 cm/px

Transects

Angle 0.0 deg

Turnaround dist 5.00 m

Options

Rotate Entry Point

Statistics

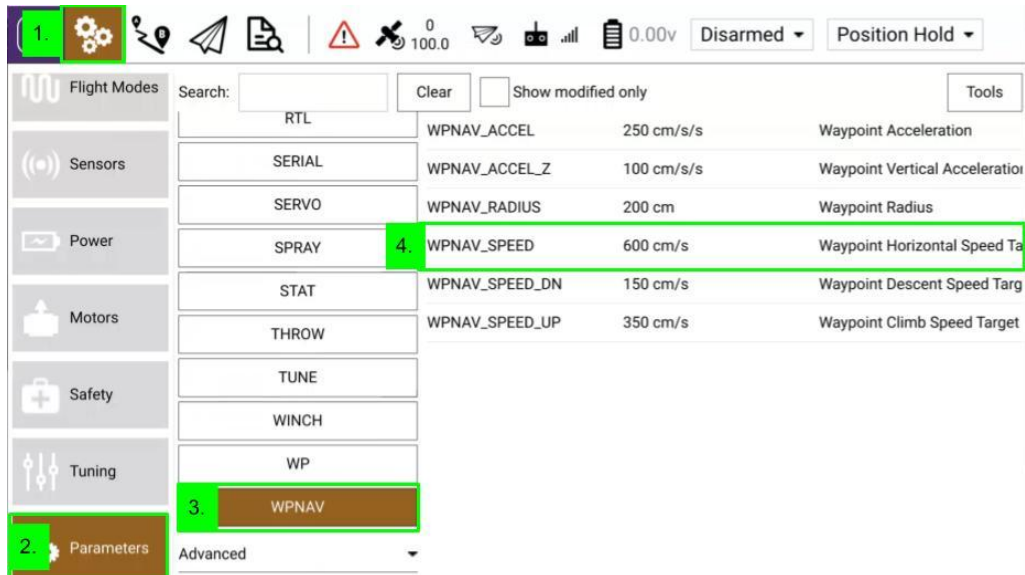
Survey Area	27248.99 ft ²
Photo Count	225
Photo Interval	0.7 secs
Trigger Distance	2.61 m

4. Adjusting Mission Speed Parameters

- Adding a waypoint to your mission will allow you to adjust the mission Flight Speed. Each waypoint is numbered in sequence. Select the Takeoff Tab and add a waypoint between Takeoff and Survey by selecting the Waypoint option on the left side of the screen and tapping the map to place a new point between Launch and the first survey waypoint, we will see a #2 added for our new Waypoint. Check the Flight Speed box and enter your desired speed. Checking Flight Speed adds a new action point to the mission plan so we see a #2 for our newly created waypoint and a #4 for our Survey Mission starting point. The #3 action is the change in Flight Speed. For our sample, we used 4.0 m/s. **Note:** Make sure the Hover Speed shown in the Mission Start tab matches the adjusted waypoint Flight Speed to ensure accurate mission settings are achieved.

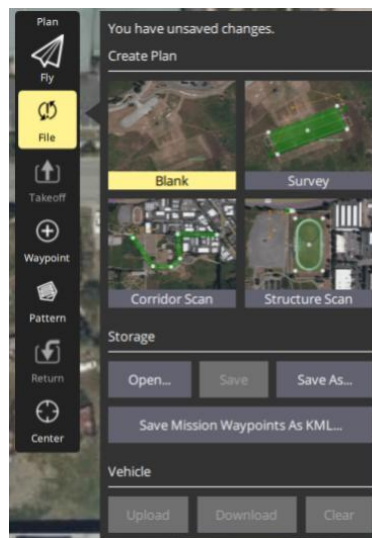


- After a waypoint with the Flight Speed checkbox, the remainder of the mission will proceed at the selected speed. **Note:** If you cancel and restart your mission from a selected waypoint (battery swap mid-mission, etc), the vehicle will default to the speed set in the WP_NAV_SPEED parameter unless it travels to a waypoint with a Flight Speed box checked. To change the default speed, you will need to change the WP_NAV_SPEED parameter, which will remove the need to create a waypoint to change the speed.
- To change the WP_NAV_SPEED parameter, **with the vehicle powered on**, select the Vehicle Settings icon, scroll down on the left and select the “Parameters” tab, then scroll down again to the “WP” parameters. WP_NAV_SPEED can be changed by selecting the value to the right of the parameter name, and changing the value. The units are in centimeters/second, so you will need to convert the speed you need for your mission. (Ex: 600cm/sec = 6m/s = 13.42mph) **Note:** Be aware that all vehicle parameters are accessible within the “Parameters” tab, and some, if changed, can create vehicle instability. Please take caution when changing parameters, and avoid doing so as much as possible.



5. Starting a mission

- Using the QGC mission plan screen, below the Fly option select File. There you can create a mission, save a mission for later use, open an existing mission or upload the mission plan to the vehicle. This can be done on a computer using QGC software or using the Herelink controller. When you are comfortable with your mission outline, upload your mission to the vehicle.



- With a Mission uploaded, the vehicle will now show a slider to start or continue the mission. **Note:** Always conduct a manual pilot takeoff to establish a stable hover, then sliding to continue your mission to ensure safe operation.

Start Mission



Takeoff from ground and start the current mission.



Slide to confirm