

PPK Post Processing

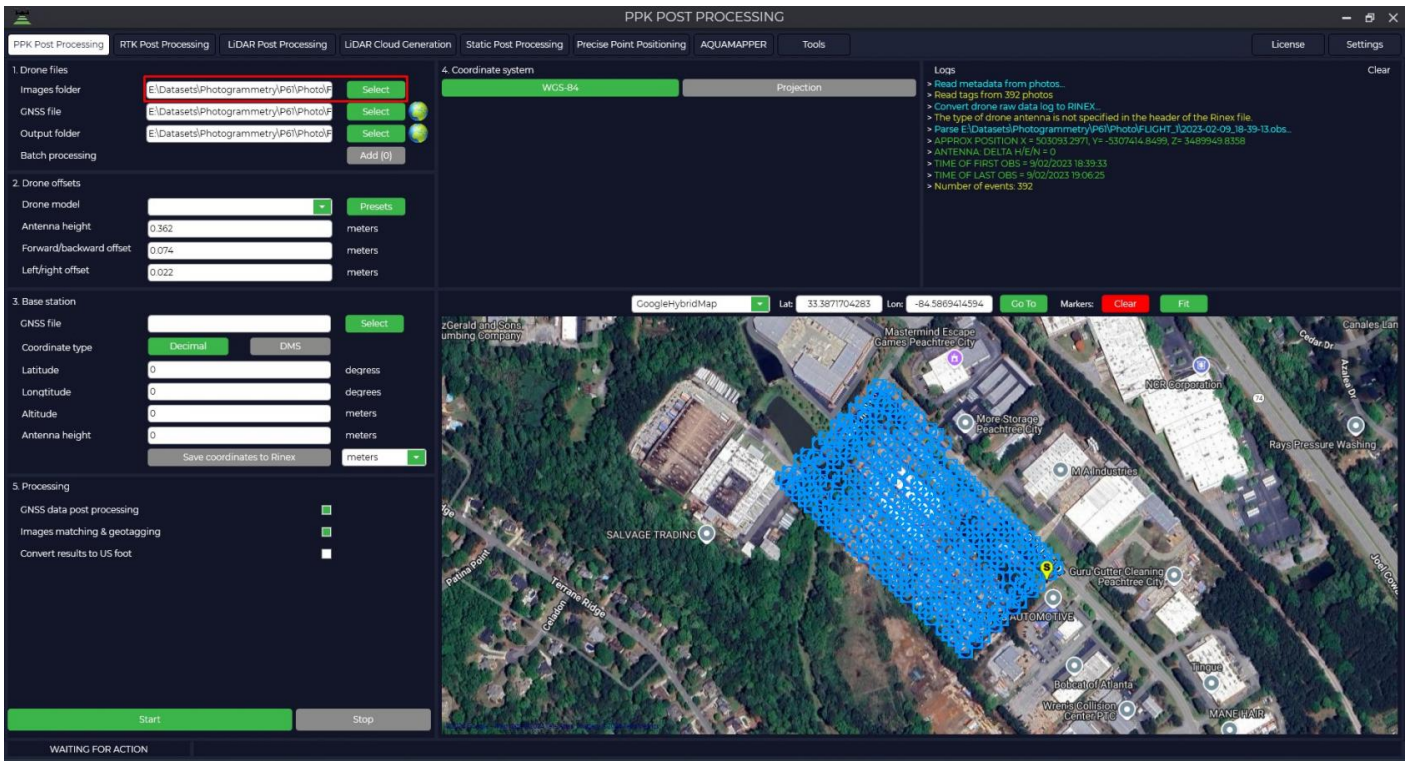
This module allows automatic processing of GNSS measurements, where a U-blox chip receiver acts as a rover. To perform processing in this module, perform the following procedure:

1. Run the TOPODRONE Post Processing.

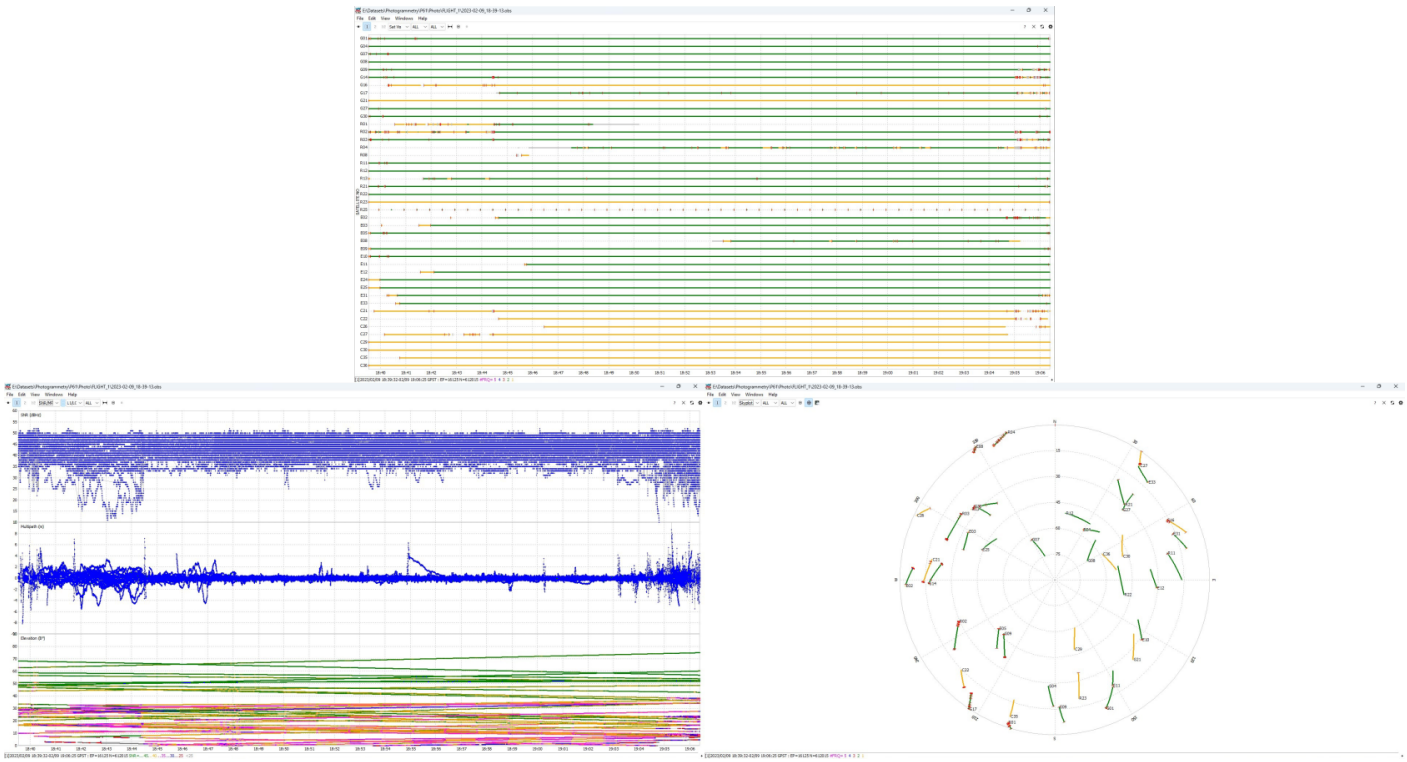
The screenshot shows the 'PPK POST PROCESSING' software interface. The top menu bar includes 'PPK Post Processing', 'RTK Post Processing', 'LIDAR Post Processing', 'LIDAR Cloud Generation', 'Static Post Processing', 'Precise Point Positioning', 'AQUAMAPPER', and 'Tools'. The main interface is divided into several sections:

- 1. Drone files:** Includes input fields for 'Images folder', 'GNSS file', and 'Output folder', each with a 'Select' button. There is also a 'Batch processing' section with an 'Add (0)' button.
- 2. Drone offsets:** Includes a 'Drone model' dropdown with a 'Presets' button, and input fields for 'Antenna height' (0.362 meters), 'Forward/backward offset' (0.074 meters), and 'Left/right offset' (0.022 meters).
- 3. Base station:** Includes a 'GNSS file' input with a 'Select' button, a 'Coordinate type' dropdown (set to 'Decimal'), and input fields for 'Latitude' (0 degrees), 'Longitude' (0 degrees), 'Altitude' (0 meters), and 'Antenna height' (0 meters). There is a 'Save coordinates to Rinex' button.
- 4. Coordinate system:** Includes a 'WGS-84' dropdown and a 'Projection' dropdown.
- 5. Processing:** Includes checkboxes for 'GNSS data post processing' (checked), 'Images matching & geotagging' (checked), and 'Convert results to US foot' (unchecked).
- Map:** A Google Hybrid Map showing the world, with a 'Go To' button and 'Markers' (Clear) and 'Fit' buttons.
- Buttons:** A large green 'Start' button and a grey 'Stop' button are at the bottom left.
- Status:** A 'WAITING FOR ACTION' status bar is at the bottom.

2. Select a folder with photos. The "Output folder" with final results of processing will be automatically created, if necessary it can be changed. If there is a *.ubx file from this flight in the folder with photos, data conversion to *.obs will take place. Otherwise it is necessary to select *.ubx file from this flight separately.

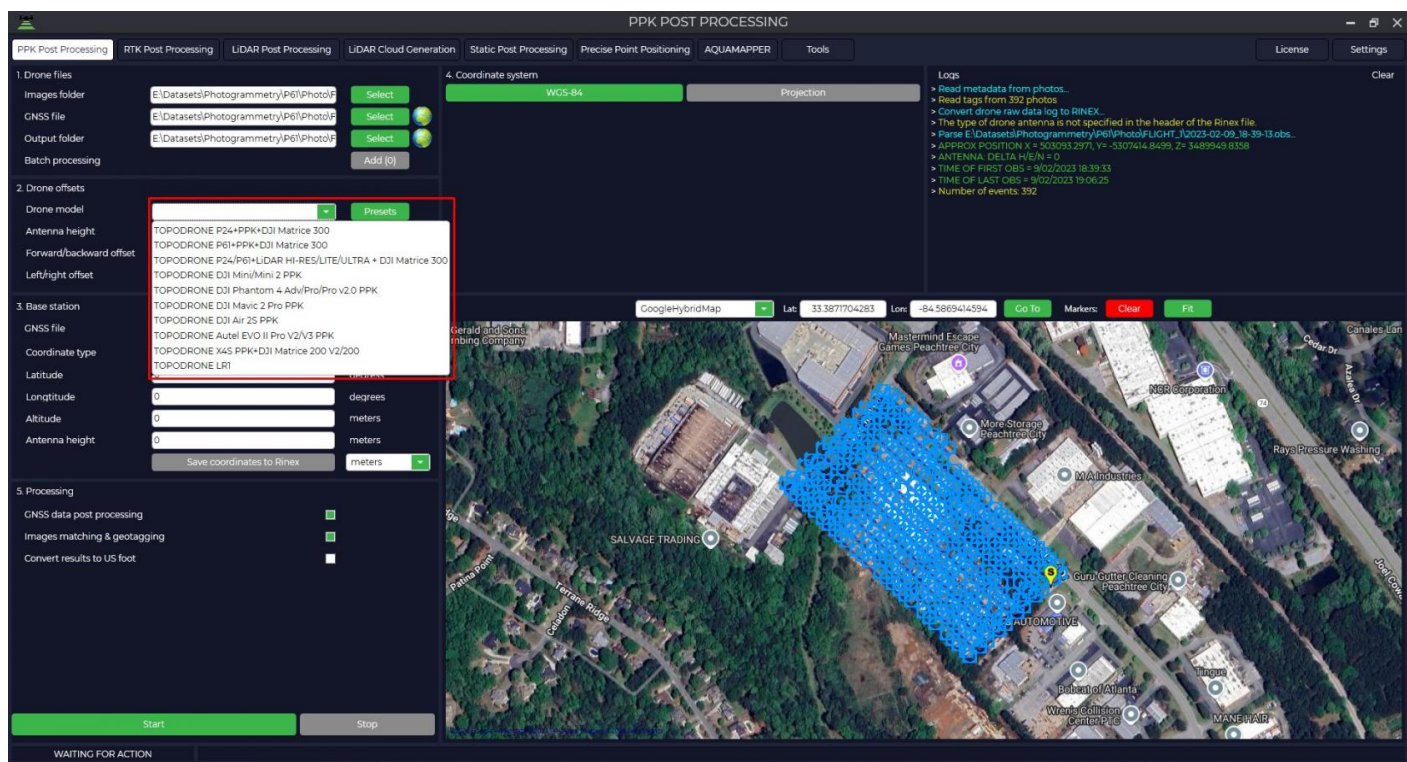


3. By pressing the button  you can analyze the quality of the data. For more information about data quality analysis, see [Appendix B](#).



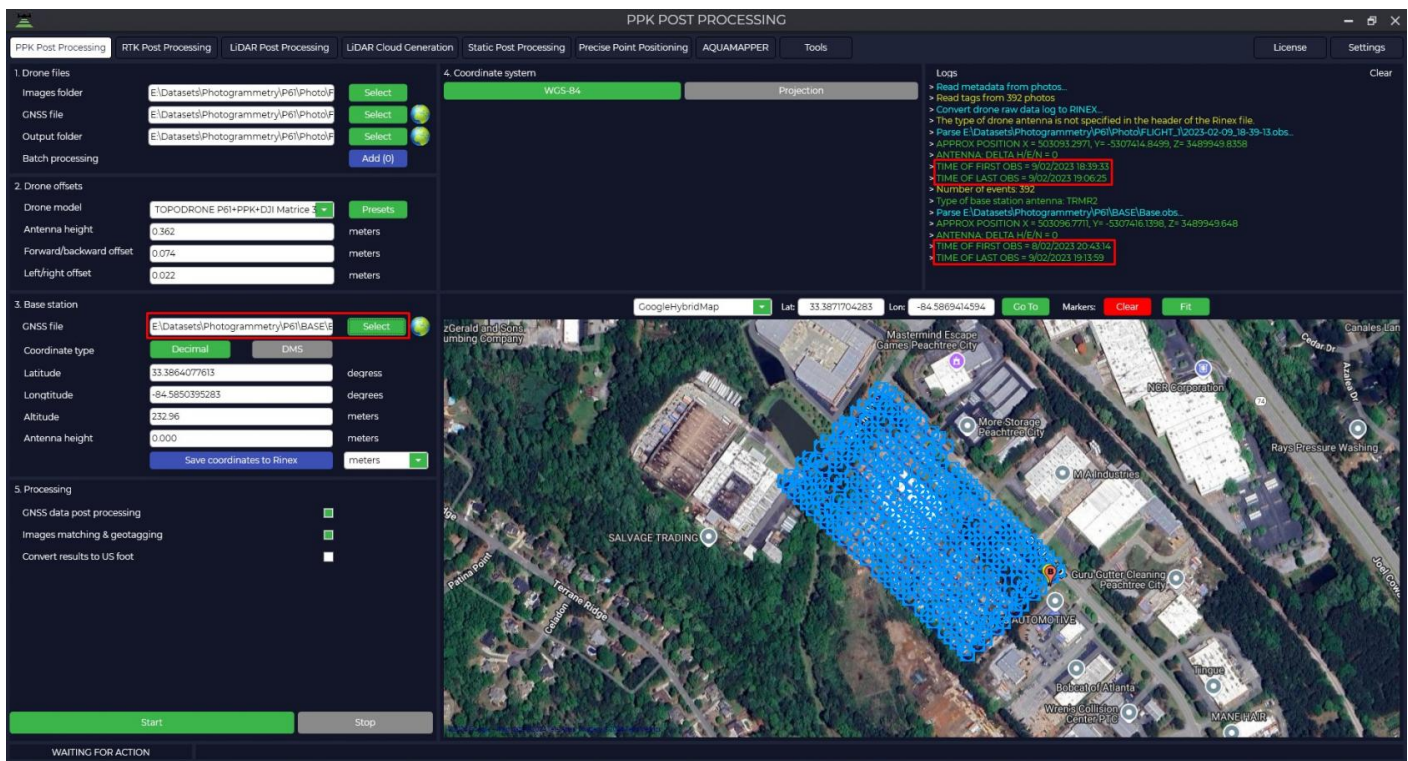
4. From the drop-down list select "Drone Model" to take into account the offset of the GNSS antenna and the center of the camera sensor. If necessary, you can add your own data to the drop-down list by

clicking the "Presets" button and entering the necessary offsets.



5. Select the file from the base station (*.ubx, *.obs, *.rnx, *.YYo). For files in *.rnx and *.ubx formats, it will automatically start the conversion process to *.obs format

The "Logs" window displays information about actions performed by the program, it is necessary to pay attention to the time of file recording from the rover and from the base station. The base station file must overlap the rover files.



The TOPODRONE Post Processing will automatically load base station coordinates and base antenna height from the Rinex file, taking into account that it was entered during measurement

6. In case your coordinate system is different from WGS-84, you need to click the "Projection" button and select your coordinate system from the proposed list or enter the coordinate system name in the search bar.



7. If your coordinate system is not in the list, you can add it to the TOPODRONE Post Processing

program. When you select a coordinate system, it will be converted from WGS-84 to the selected projection. If necessary, correct the coordinates of the base station.

The height of the antenna includes the height of the milestone or tripod from the point of known coordinates to the bottom of the receiver mount and the height from the bottom of the receiver mount to the phase center.

3. Base station

GNSS file 

Coordinate type

North meters

East meters

Height meters

Antenna height meters



8. Change the type of height used, if you select any of the types, the height is automatically converted.

4. Coordinate system

Calibration 

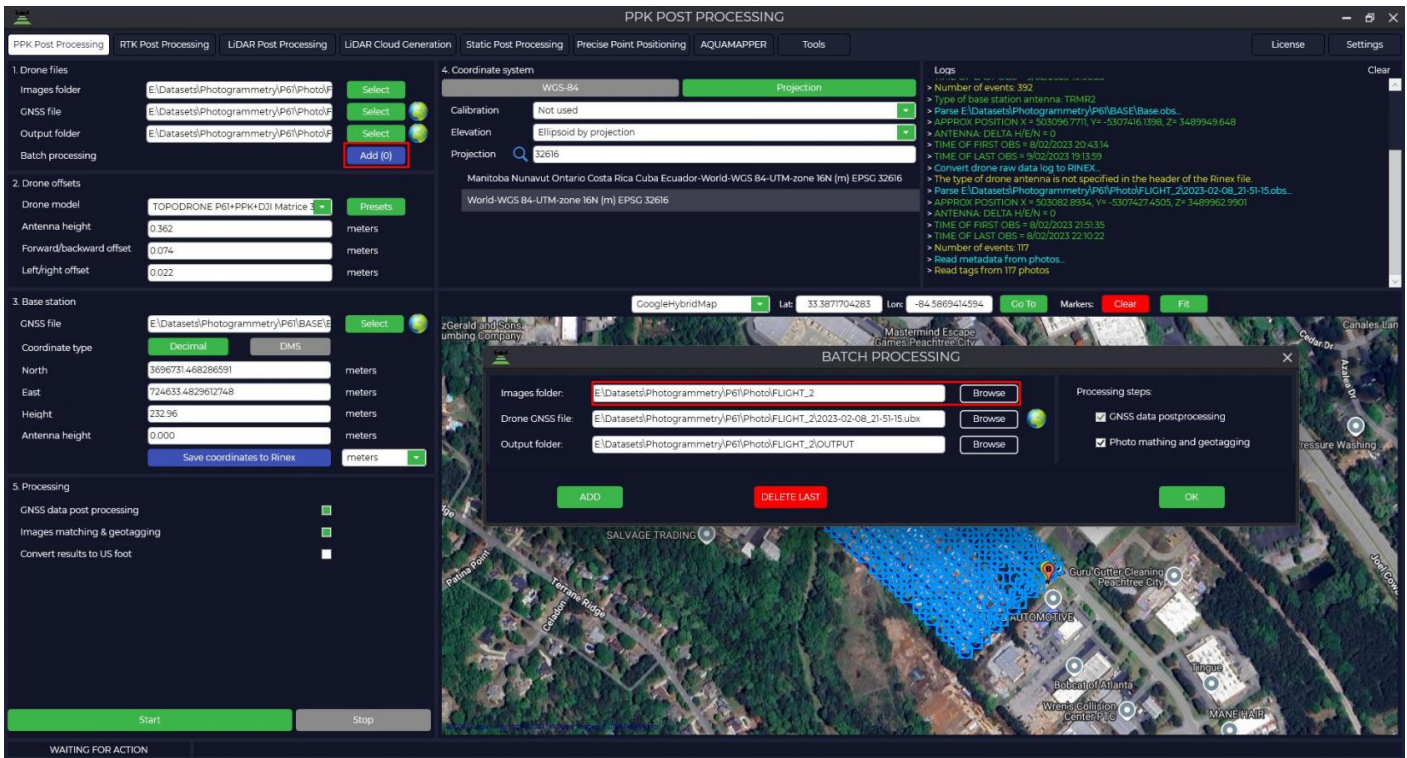
Elevation 

Projection 

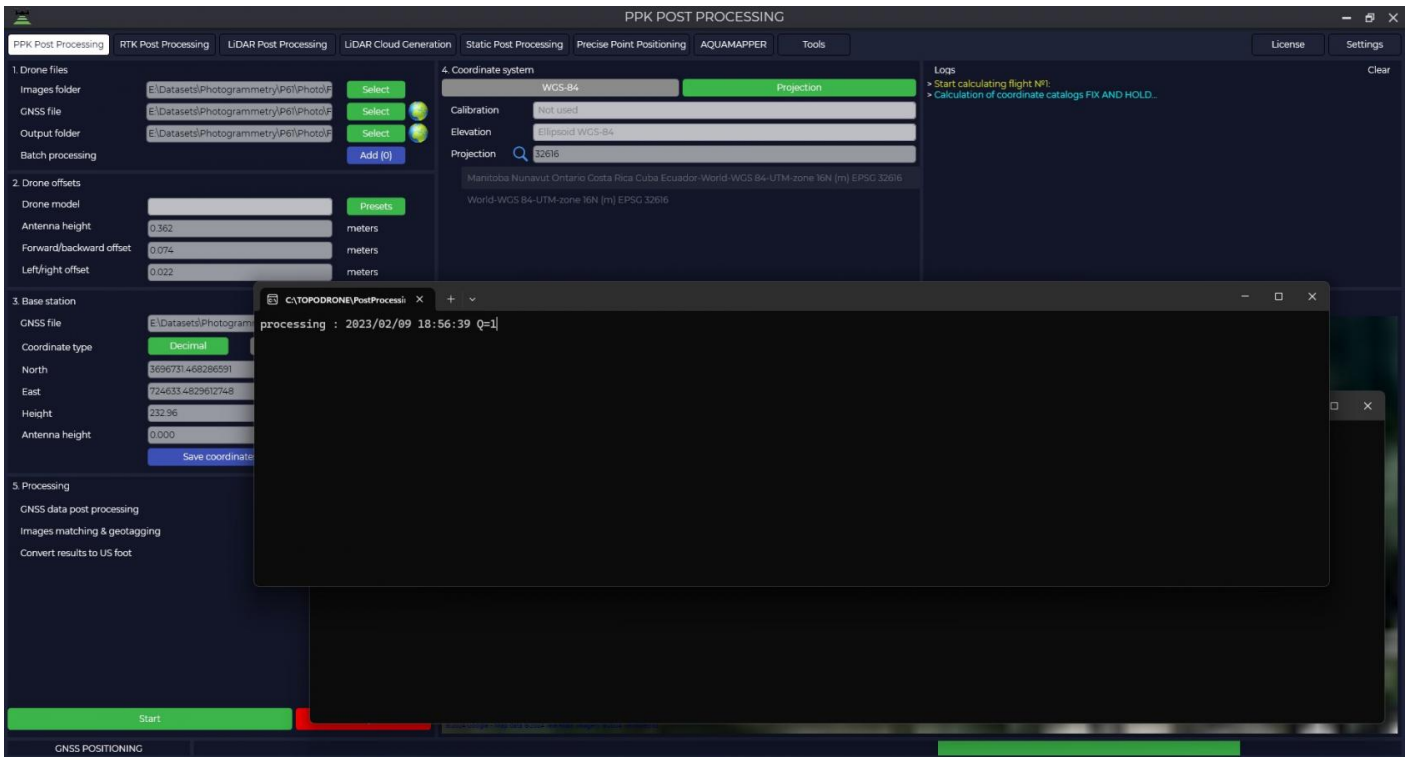
Manitoba Nuna

World-WGS 84

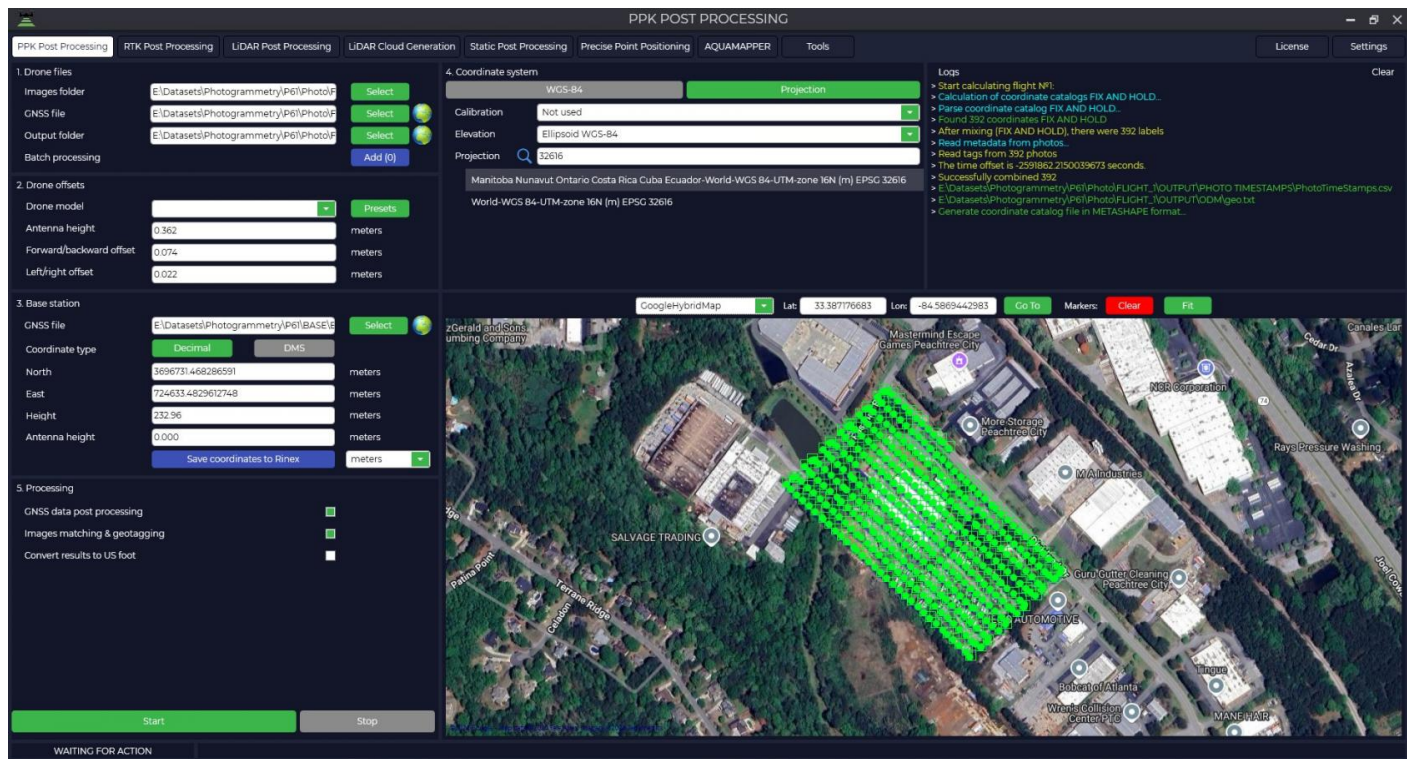
9. TOPODRONE Post Processing program allows to perform batch processing of many flights from one base station within one observation session. To start batch processing it is necessary to press the "Add (0)" button, in the opened window add additional folders with photos, *.ubx files and press "OK"



10. Just press the "Start" button to start the machining process. Data processing takes place simultaneously in forward and reverse directions and the type of solution is displayed in the form of the letter "Q" with the addition of a number, where Q1 - fixed solution, Q2 - floating solution and Q5 - no solution.



11. At the end of processing a window will be displayed, where you can see the trajectory of the rover, the number of photos, the number of marks, the number of matches and the accuracy of the obtained centers of photos, where green marks are marks obtained with a fixed solution, and yellow marks are marks obtained with a floating solution.



12. In the output folder, a catalog of coordinates of the exact photo centers is saved.

Name	Latitude	Longitude	Altitude(elipsoid)	Accuracy	Sdn	Sde	Sdu	North	East	Elevation		
TDP00119.JPG	33.385542647628974	-84.58626748834081	280.551	0.05	0.003	0.003	0.003	0.008	3696632.871	724521.46	280.551	
TDP00120.JPG	33.38560781762898	-84.58632996834089	280.776	0.05	0.003	0.004	0.008	3696639.964	724515.479	280.776		
TDP00121.JPG	33.38568775762898	-84.58643353834101	281.847	0.05	0.003	0.003	0.008	3696648.606	724505.637	281.847		
TDP00122.JPG	33.38575308762898	-84.58651961834109	283.005	0.05	0.003	0.003	0.009	3696655.666	724497.46	283.005		
TDP00123.JPG	33.38582289762898	-84.58660892834119	283.948	0.05	0.004	0.004	0.009	3696663.216	724488.971	283.948		
TDP00124.JPG	33.38587220762898	-84.58667200834127	284.239	0.05	0.003	0.004	0.009	3696668.548	724482.976	284.239		
TDP00125.JPG	33.38595018762898	-84.58677049834137	284.401	0.05	0.004	0.003	0.008	3696676.984	724473.612	284.401		
TDP00126.JPG	33.38602007762898	-84.58685930834146	284.002	0.05	0.004	0.004	0.009	3696684.544	724465.169	284.002		
TDP00127.JPG	33.38608709762898	-84.58695098834154	283.712	0.05	0.004	0.004	0.009	3696691.779	724456.467	283.712		
TDP00128.JPG	33.38615527762898	-84.58703889834165	283.281	0.05	0.004	0.004	0.009	3696699.151	724448.112	283.281		
TDP00129.JPG	33.386226847628976	-84.58712819834174	282.852	0.05	0.004	0.004	0.009	3696706.896	724439.62	282.852		
TDP00130.JPG	33.38629444762898	-84.58721454834183	282.46	0.05	0.004	0.004	0.009	3696714.207	724431.412	282.46		
TDP00131.JPG	33.38636529762898	-84.58730387834193	282.058	0.05	0.004	0.004	0.009	3696721.872	724422.919	282.058		
TDP00132.JPG	33.386435867628975	-84.58739672834203	281.655	0.05	0.004	0.004	0.007	3696729.498	724414.098	281.655		
TDP00133.JPG	33.38650811762898	-84.58749026834212	281.231	0.05	0.005	0.004	0.008	3696737.309	724405.21	281.231		
TDP00134.JPG	33.38657620762898	-84.58758083834222	280.865	0.05	0.005	0.004	0.007	3696744.666	724396.608	280.865		
TDP00135.JPG	33.386645147628975	-84.58766827834232	280.465	0.05	0.005	0.004	0.008	3696752.123	724388.296	280.465		
TDP00136.JPG	33.38671493762898	-84.5877564683424	280.12	0.05	0.006	0.004	0.009	3696759.673	724379.911	280.12		
TDP00137.JPG	33.386787087628974	-84.5878484783425	279.653	0.05	0.005	0.004	0.008	3696767.476	724371.165	279.653		
TDP00138.JPG	33.38685567762898	-84.5879371383426	279.626	0.05	0.005	0.004	0.007	3696774.892	724362.74	279.626		
TDP00139.JPG	33.38688476762898	-84.58797475834264	279.73	0.05	0.005	0.004	0.007	3696778.037	724359.165	279.73		
TDP00140.JPG	33.38695614762898	-84.58806978834274	280.331	0.05	0.005	0.004	0.007	3696785.749	724350.14	280.331		
TDP00141.JPG	33.387025817628974	-84.58816073834282	281.191	0.05	0.005	0.004	0.008	3696793.279	724341.499	281.191		
TDP00142.JPG	33.38709458762898	-84.58824818834293	282.163	0.05	0.005	0.004	0.007	3696800.718	724333.186	282.163		
TDP00143.JPG	33.38716877762898	-84.58833925834303	282.975	0.05	0.005	0.004	0.007	3696808.75	724324.522	282.975		
TDP00144.JPG	33.38723616762898	-84.58842577834311	283.516	0.05	0.006	0.004	0.009	3696816.037	724316.299	283.516		
TDP00145.JPG	33.387249357628974	-84.58844308834314	283.565	0.05	0.005	0.004	0.008	3696817.462	724314.655	283.565		
TDP00146.JPG	33.387327847628974	-84.58854531834324	283.657	0.05	0.005	0.004	0.007	3696825.947	724304.942	283.657		
TDP00147.JPG	33.38739488762898	-84.58863347834334	283.325	0.05	0.005	0.004	0.009	3696833.192	724296.567	283.325		
TDP00148.JPG	33.38746521762898	-84.58872426834343	282.931	0.05	0.005	0.004	0.008	3696840.796	724287.94	282.931		
TDP00149.JPG	33.38753383762898	-84.58881196834352	282.526	0.05	0.005	0.004	0.009	3696848.218	724279.604	282.526		
TDP00150.JPG	33.38760414762898	-84.58890475834362	282.249	0.05	0.005	0.004	0.009	3696855.815	724270.79	282.249		
TDP00151.JPG	33.387664337628976	-84.58896023834369	282.634	0.05	0.005	0.004	0.01	3696862.371	724265.474	282.634		
TDP00152.JPG	33.38774104762898	-84.5888670683438	283.395	0.05	0.005	0.004	0.01	3696871.08	724273.945	283.395		
TDP00153.JPG	33.387750537628975	-84.58883152834382	283.522	0.05	0.005	0.004	0.008	3696872.209	724277.227	283.522		
TDP00154.JPG	33.38770093762898	-84.58875115834375	283.677	0.05	0.005	0.004	0.011	3696866.881	724284.832	283.677		
TDP00155.JPG	33.38762397762898	-84.58865559834365	284.644	0.05	0.004	0.003	0.012	3696858.552	724293.921	284.644		
TDP00156.JPG	33.38755755762897	-84.58856740834355	285.481	0.05	0.003	0.003	0.012	3696851.376	724302.296	285.481		
TDP00157.JPG	33.387487487628974	-84.58847653834346	286.37	0.05	0.003	0.003	0.012	3696843.8	724310.931	286.37		
TDP00158.JPG	33.38741763762898	-84.58838894834336	286.47	0.05	0.003	0.003	0.013	3696836.243	724319.26	286.47		

Revision #19

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