PPK Accuracy

Reduce time and costs with a PPK-enabled Marlyn!

Metric

Why PPK

Flight Planning | **Fewer to no GCPs needed** | Capture Data | Process & Analyse

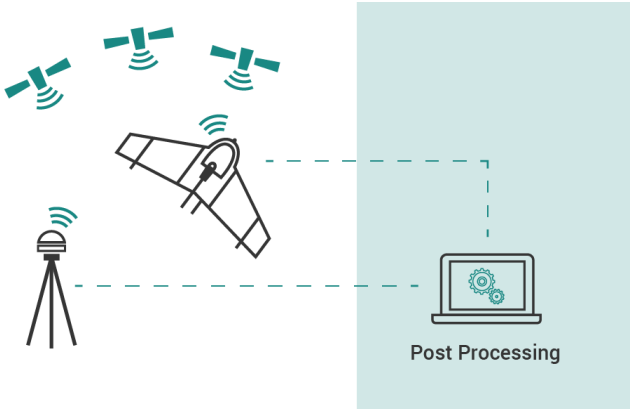
Capturing high-resolution images with ultra- precise geotagging is crucial when converting aerial imagery into accurate point clouds.

When looking at the different options to increase the geotagging accuracy, Ground Control Points (GCPs) is the least effective method as it requires a lot of time in the field and more complex post-processing which results in higher costs in the end. Using GPS correctional technology, the data is improved drastically by achieving ultra-precise geotagging as the aircraft's satellite positioning is fully augmented with supportive base station/VRS information.

The two most common methods of GPS correction technology – Real Time Kinematic (RTK) and Post Processing Kinematic (PPK).

How does it work?

A Global Navigation Satellite System (GNSS) is a constellation of satellites providing signals from space that transmit positioning and timing data to the GNSS receiver (PPK module). Each satellite constantly sends its position and the time to the reciever. The receiver then uses this data, correlated from multiple satellites, to precisely determine its location.

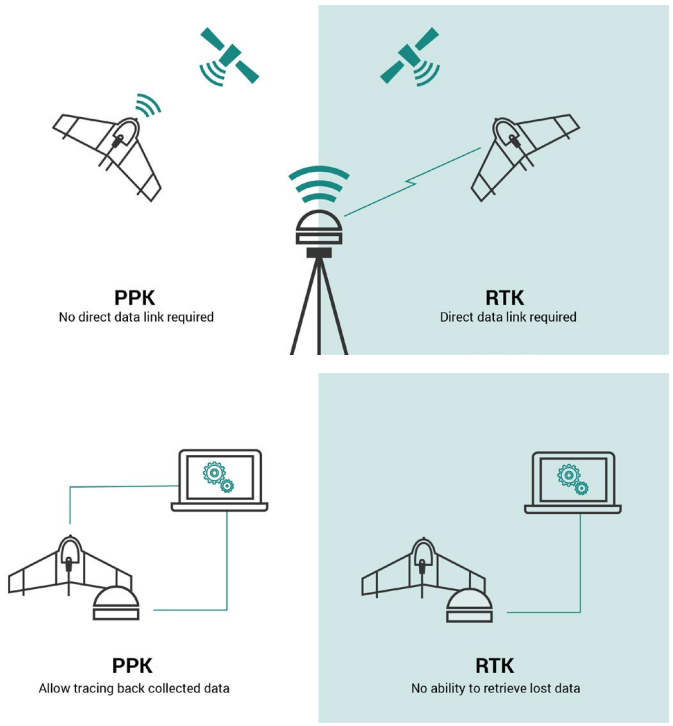


PPK vs RTK

RTK (Real Time Kinematic) relies on GNSS positioning and a stable radio link between a base station on the ground and a GPS antenna on board the drone. Due to these requirements, RTK positioning can have its downsides, with radio link outages and GNSS signal blocks. Due to the long distances between the drone and the base station, signals can be obstructed resulting in loss of correction data and a lower percentage of accurate camera positions in the flight.

PPK, on the other hand, processes the positioning information after the flight, not during. Data is logged in the aircraft and combined with data from the base station when the flight is completed. As a result, there is no risk of data or initialization loss due to radio link disruptions. PPK drones therefore offer more flexibility in terms of how and where the drone is deployed.

Regarding the processing of the captured data, both technologies are similar, however PPK is more thorough as it traces back and forth through the data multiple times to give more comprehensive results.



Performance

AsteRx-m2a UAS

- Multi-constellation, multi-frequency all-in-view satellite tracking
- Centimeter-level (RTK) position accuracy with or without a real-time datalink
- Heading output for orientation or INS integrations
- AIM+ anti-jamming and monitoring system
- Camera shutter synchronisation

Position Accuracy	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.7 m

RTK Accuracy	
Horizontal accuracy	0.6 cm + 0.5 ppm
Vertical accuracy	1 cm + 1 ppm
Initialisation	7s

GNSS Attitude Accuracy	Heading	Pitch/ Roll
Antenna separation 1m	0.15°	0.25°
Antenna separation 5m	0.03°	0.05°

Velocity Accuracy	0.03 m/s

Maximum update rate	
Position	100 Hz
Position and attitude	50 Hz
Measurements only	100 Hz

Latency	<10 ms

Time precicion	
xPPS Out	5 ns
Event accuracy	<20 ns

Time to first fix	
Cold start	< 45 s
Warm start	< 20 s
Re-acquisition	avg 1 s

Tracking performance	
Tracking	20 dB-Hz
Acquisition	33 dB-Hz