

Applanix POSPac Post-Processed CenterPoint® RTX™ (PP-RTX)

Frequently Asked Questions

1) What is Applanix POSPac Post-processed Centerpoint RTX (PP-RTX)?

POSPac PP-RTX is a cloud-based global GNSS correction service which utilizes Trimble's RTX technology to provide centimeter-level post-processed positioning accuracy without base stations. The Trimble RTX technology utilizes data from a dedicated global network of tracking stations to compute corrections to satellite orbit and clock information as well as atmospheric delay models. POSPac uses this data to post-process the GNSS-Inertial Trajectory as an alternative to the known Single Base, Applanix SmartBase™ and Multi-SingleBase augmentation processing methods.

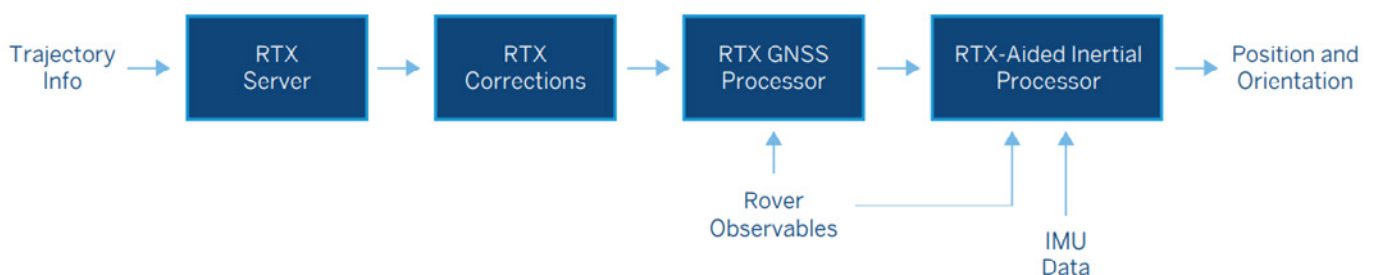
2) What is the coverage of this service and when is it available?

The service works globally, and correction data are available within minutes after data collection has been completed.

3) How does PP-RTX work?

Trajectory information logged during the mission is sent to the Trimble RTX server by POSPac. This information is used to generate a set of RTX corrections unique to the mission, which are then transmitted back to POSPac. POSPac processes the corrections along with the raw GNSS and IMU data to generate an SBET with centimeter level accuracy, all without the need for local base stations.

- ▶ Trajectory information sent to Trimble Cloud
- ▶ Localized RTX Corrections returned from the Cloud
- ▶ CenterPoint RTX-Aided Inertial solution generated at 200 Hz



4) What is meant by “Convergence time” and does this matter for POSPac PP-RTX?

Convergence time is the amount of time it takes for the RTX position accuracy to reach its final centimeter-level accuracy, as the residual errors left after the corrections are applied are estimated. Since the POSPac PP-RTX solution is processed in the forward and reverse directions and then combined, all convergence effects are removed. The only restriction is that the length of trajectory itself must be longer than the convergence time in order to achieve full accuracy.

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5) Is there a difference in convergence time for different regions of the world?

Yes, the RTX service is segmented into a global region and fast regions.

Fast Region: Convergence time is 1 - 2 minutes. Datasets from 10 minutes to several hours can reliably be processed at 3 cm horizontal and 6 cm vertical RMS error.

Global Region:

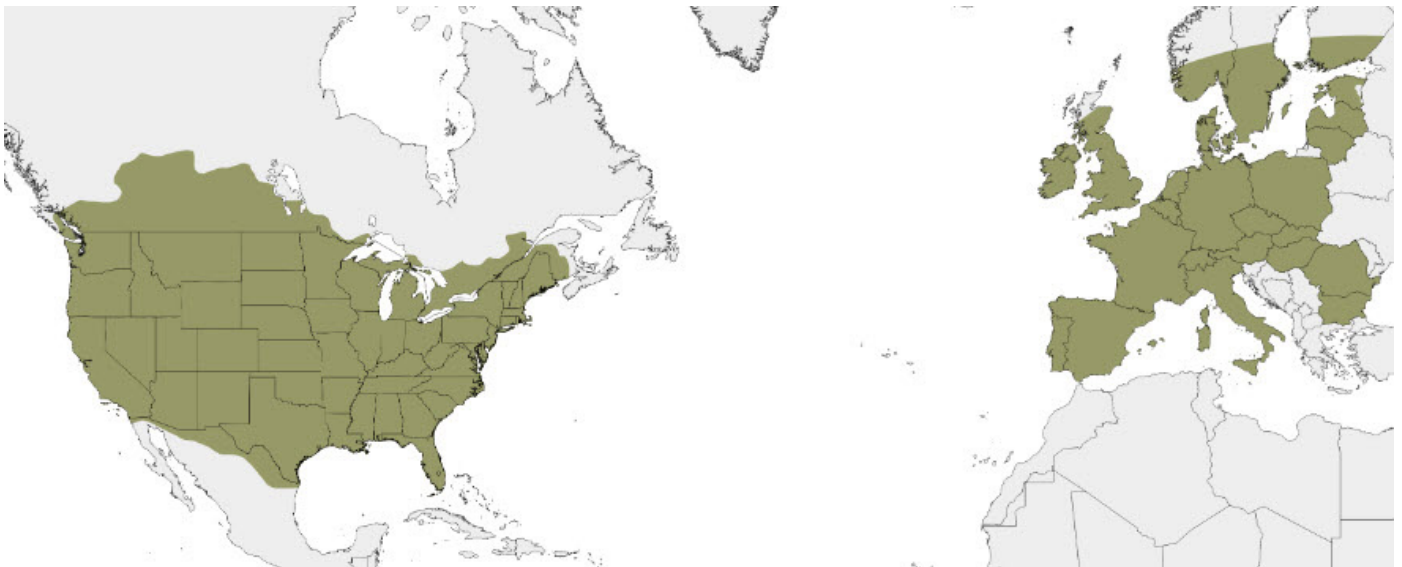
- ▶ IN-Fusion PP-RTX: Convergence time is 15 - 20 minutes.
- ▶ IN-Fusion+ PP-RTX 2: Convergence time is < 3 minutes with Beidou-III

6) Why is the convergence time better in the Fast Regions?

Fast Regions use a denser network of reference stations to compute a regional ionospheric model for atmospheric corrections while the global region uses a global model.

7) Where are the Fast Regions?

The current Fast Regions are illustrated below. The Fast Regions are continuously being expanded.



8) What application can PP-RTX be used for?

Crewed Airborne:

Due to the mission size, crewed airborne projects can exceed the maximum of 20 km distance from a single base station required for a precise GNSS-Inertial solution. PP-RTX has no such limitation and is hence ideal for crewed aerial surveys. Since PP-RTX is a global service, it eliminates the cost and headache of setting up or procuring local base stations in different countries or remote locations.

Uncrewed Airborne (UAV):

Short flights (10 – 30 minutes) can be processed using IN-Fusion PP-RTX while in Fast Region coverage, or with IN-Fusion+ PP-RTX 2 processing in

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the Fast or Global Regions as long as the proper signal tracking has been enabled. Longer flights (> 30 minute) can be processed in either region, and with either PP-RTX or PP-RTX 2 to obtain the same level of accuracy. This is particularly useful for BVLOS applications or longer linear flights such as those associated with corridor mapping. PP-RTX is also ideal for UAV mapping applications in remote regions such as mountainous and forested areas where existing base stations are not present, and setting up a base station can be difficult.

Land Application:

PP-RTX currently requires clean GNSS observables with minimal cycle slips and interruptions. Since land applications are typically exposed to frequent GNSS disruptions (buildings, vegetation, tunnels) in urban environments, the PP-RTX service will not achieve full accuracy. For missions in rural areas with no or only a few GNSS occlusions, it may produce adequate results. Contact Trimble Applanix for more details.

Marine Application:

The POSPac PP-RTX service can be used for all POS MV systems and applications. For offshore projects and remote coastal line surveys, it is the only cost-effective method for achieving centimeter level position accuracy. Surveys in ports or missions close to the mainland, POSPac PP-RTX eliminates the cost needed to procure or set up local base stations.

9) What sensors can be used in conjunction with the PP-RTX service?

A wide variety of sensors for direct geo-referencing can be used such as:

- ▶ LiDAR
- ▶ Camera (RGB, NIR etc.)
- ▶ Hyperspectral Sensor
- ▶ Multibeam Sonar
- ▶ SAR

10) How do I enable PP-RTX in POSPac?

Applanix typically offers a 6 or 12 months subscription license for PP-RTX. The subscription license can be purchased through the sales or support channel. The license is activated through the Software License Utility (SLU).

11) What are the requirements to run PP-RTX in POSPac?

- ▶ PP-RTX Subscription license
- ▶ Internet Connection¹
- ▶ Minimum of 10 – 15 min rover data for fast region
- ▶ Minimum of 30 min rover data for standard region
- ▶ Clean L1/L2 data
- ▶ Calibrated antenna mode

¹ License check only with IN-Fusion+ PP-RTX 2 if CenterPoint RTX corrections have been logged in real-time

12) What POSPac variants support PP-RTX?

All POSPac variants support PP-RTX, i.e. POSPac MMS, POSPac UAV, POSPac Cloud, and POSPac Go!.

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13) What are the core benefits of PP-RTX?

- ▶ Worldwide coverage
- ▶ Data are available within minutes after mission completion
- ▶ CM level accuracy, approaching that of RTK
- ▶ Eliminate the need of base station data
 - ▶ From own setup
 - ▶ From various download sources
 - ▶ From commercial provider procurement
- ▶ Reliable 24/7/365 monitored cloud service
- ▶ Single button or automated functionality
- ▶ Improves efficiency and productivity

14) What are the limitations when using PP-RTX?

While PP-RTX is a very robust technique, it is currently not recommended for urban land application. PP-RTX requires clean observables which is a challenge in land applications exposed to obstructions.

15) Is this service supported in real-time?

Yes, [Trimble's CenterPoint® RTX™](#) is also available in real-time. Please note, this is not PP-RTX. It requires a separate subscription (activated over-the-air or via a manual passcode on the hardware) and the appropriate infrastructure (e.g. L-Band Antenna or Internet). The coverage is not worldwide when receiving the data through the L-Band antenna over satellite.

You can check the coverage here:

<https://positioningservices.trimble.com/resources/coverage-maps/>

In addition, the expected performance is lower than the PP-RTX feature in POSPac.

16) Can I use PP-RTX in POSPac if I have a valid Real-Time CenterPoint RTX subscription?

No, PP-RTX is a separate subscription and tied to POSPac.

17) Which GNSS constellations are supported by PP-RTX?

PP-RTX service supports GPS, GLONASS, GALILEO, BEIDOU and QZSS.

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18) Are there PP-RTX demo subscriptions available?

Yes, please contact techsupport@applanix.com to obtain a demo license for PP-RTX.

19) How much does PP-RTX Subscription cost?

Please get in touch with techsupport@applanix.com or sales@applanix.com

20) When do I use PP-RTX?

PP-RTX is best to use when:

- ▶ Mission area is large (baseline exceeds 20km)
- ▶ Mission consists of several short sub-missions distributed over wider areas
- ▶ Corridor mapping
- ▶ Coastal zone mapping
- ▶ Access restricted areas
- ▶ No CORS or VRS serviced areas
- ▶ Operating international

21) What is the benefit of using IN-Fusion+ PP-RTX 2?

- ▶ Faster convergence time, especially in the Global Region for short UAV flights
- ▶ No trajectory information required to be uploaded to the PP-RTX Server
 - ▶ Correction data are obtained via an internet connection in download mode only, or from logged real-time over-the-air corrections
- ▶ Higher success rate for fixed ambiguity solution

22) Can the PP-RTX subscription period be longer than my perpetual maintenance or term license period?

No, those must align to guarantee best performance. PP-RTX shall always be used with the latest POSPac version and hence the same end date of subscription, term or maintenance is strongly recommended. There is no conflict if the PP-RTX subscription period is shorter (except this service stops after expiration) than the term license period or perpetual maintenance window.

Specifications subject to change without notice.

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