

Technical Note



IN-Fusion+ PP-RTX 2

Document Description	Revision	Author
Guidelines, Requirements, Benefits of IN-Fusion+ PP-RTX 2	REV0	Nico Jaeger

Introduction

This document provides guidelines, requirements and benefits of using the **IN-Fusion+ PP-RTX 2** processing mode in the next generation of POSPac post-processing SW (v9). This new processing mode will be an addition to the current **IN-Fusion PP-RTX** mode (Applanix PP-RTX®) in POSPac and will first be targeting the uncrewed airborne (UAV) market with equipped APX boards. In order to benefit from this new processing mode it is essential that the additional signals and frequencies from all GNSS Satellite Navigation Systems are logged. The initial release of this new processing mode will address the uncrewed airborne business using the **PP-RTX for UAV** subscription.

Requirements

The advantage of the new **IN-Fusion+ PP-RTX 2** processing is the usage of the multi-satellite and multi-frequency GNSS constellation. In particular, the new BDS-III signals B1C & B2A from the Beidou Satellite Navigation System aid significantly to the PP-RTX convergence time and performance in the Global PP-RTX Region (further background about PP-RTX can be found [here](#)). The APX-15/APX-18/APX-20/AP+ 18/AP+ 20 boards support these signals

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and they need to be enabled on the board should this not already be the case (all boards delivered since spring 2022 should already have this enabled unless actively changed). The minimum required firmware is version **8.2**. In general, it is always recommended to use the latest firmware to benefit from recent improvements in real-time and in post-processing mode. In case the B1C signal is not available for selection under “[Receiver Configuration/Tracking](#)” Applanix Customer Support can provide an authorization code to enable B1C (under “[Receiver Status/Receiver Options](#)”). Below is a screenshot showing the required satellite tracking setup on the APX board:

Type	Signal	Enable	Options
GPS	L1 - C/A	☒	
GPS	L1C	☐	
GPS	L2E	☒	L2C and L2E ▾
GPS	L2C	☒	CM + CL ▾
GPS	L5	☒	I + Q ▾
SBAS	L1 - C/A	☒	
SBAS	L5	☐	
GLONASS	L1 - C/A	☒	
GLONASS	L1P	☐	
GLONASS	L2P	☐	
GLONASS	L2 - C/A	☒	
GLONASS	L3	☐	
Galileo	E1	☒	
Galileo	E5 - A	☐	
Galileo	E5 - B	☐	
Galileo	E5 - AltBOC	☒	
BeiDou	B1	☒	
BeiDou	B1C	☒	
BeiDou	B2	☒	
BeiDou	B2A	☒	
BeiDou	B2B	☐	
QZSS	L1 - C/A	☒	
QZSS	L1S	☐	
QZSS	L2C	☒	
QZSS	L5	☒	
IRNSS	L5 - C/A	☐	

Figure 1: Satellite Tracking Setup APX Board

Further requirements:

- Valid PP-RTX Subscription (accompanied by a term or perpetual GNSS-Inertial processing license with aligning end dates for term or perpetual maintenance)
- Internet Connection¹
- Minimum of 10 - 15 minutes rover data in the Fast Region or using **IN-Fusion+ PP-RTX 2** for UAV processing in the Global Region with new Beidou-III signals
- Rover must be using a calibrated GNSS antenna and associated model set in POSPac
- Clean GNSS observables must be available throughout the mission (minimal cycle slips)

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

BDS-III Satellite Tracking Verification in POSPac

In order to check the satellite tracking in POSPac the display plots can be used: "*Primary GNSS Observables & Satellite Data/Beidou Satellite Lock/Elevation*".



Figure 2: Beidou Satellite Tracking Display Plots PP v9.0

The previous POSPac versions (e.g. v8.9) had a different signal description. They are shown below in case this is of relevance.



Figure 3: Beidou Satellite Tracking Display Plots PP v8.9

The “*L1 BOC...*” and “*L5E5A*” are the important B1C and B2A observables. Below is the translation table of the observation description:

Display Plots	Observables
L1 BOC_1_1	B1C
L5E5A IQ	B2A
E5B I	B2I
E5B B2	B2B
B1 B1	B1I

Figure 4: Beidou Observable Description

Benefits

In post-mode the benefits of using **IN-Fusion+ PP-RTX 2** processing are:

- **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
- **Faster convergence** in the Global RTX Region ([maps](#))
 - Enables short flight data processing in the Global Region (>10min)
 - Convergence time comes down from 15 - 20 minutes to < 3 minutes
 - Higher success rate for fixed ambiguity solution

Additionally, if Real-Time RTX corrections (over-the-air) have been logged during the mission, they can be used in post-processing mode (given a PP-RTX subscription license is present). The advantage is that no upload/download process of trajectory and correction data is needed. However, if real-time RTX data gaps are present, downloading the correction data by using **IN-Fusion+ PP-RTX 2** processing is a valid backup route.

For more information

For more information, contact our Customer Support Team (techsupport@applanix.com) or visit our [Customer Support Portal](#).