

POSTrack

GNSS-INERTIAL DIRECT GEOREFERENCING WITH INTEGRATED FLIGHT MANAGEMENT FOR AIRBORNE MAPPING

POSTrack tightly integrates the POS AV GNSS-Inertial direct georeferencing technology from Applanix with Flight Management System (FMS) software from TrackAir, in one compact ruggedized system. Engineered as a single system, it is compact, convenient and easily installed in all types of aircraft. Flight Management features include: mission planning with full DEM support; pilot guidance; automatic stabilized mount control and automatic camera triggering at pre planned intervals. POS AV features include in-air initialization, levelling of stabilized mounts, automatic drift correction, GNSS position translation using encoder data from stabilized mounts, and generation of exterior orientation of each image for the mapping process. These features significantly reduce the cost of airborne mapping by improving the efficiency of data collection and the map production process.

In addition, because Applanix is a Trimble Company (NASDAQ: TRMB), POS AV is unique in the marketplace with its ability to receive the Trimble CenterPoint RTX Correction Service. Using RTX, POS AV delivers higher accuracy and speed, lowercost, more uptime and greater reliability.

POSTrack puts you in control: various performance, price points and export control options allow you to build the right solution for your application and for your budget. And all POSTrack solutions utilize the highly productive POSpac Mobile Mapping Suite (MMS) software, featuring the Applanix IN-Fusion™ technology and Applanix SmartBase™ module. POSpac MMS enables airborne missions to be flown with higher reliability and in less time, saving fuel costs and reducing environmental impact.

Key Features

- ▶ Powerful yet easy to use mission planning software with digitization support using imagery from multiple sources
- ▶ Daylight readable Smart Pilot touch display complete with yoke mount
- ▶ Ruggedized, compact, low power hardware
- ▶ Worldwide DEM coverage for mission planning
- ▶ Integrated power and network switch with direct connect for up to two smart displays
- ▶ Automatic leveling of stabilized mounts and yaw drift correction to maintain parallel and level images
- ▶ Compact design and simplified cockpit configuration
- ▶ Real-time sensor control with precise camera triggering and forward motion compensation using DEM information IMU boresight calibration and quality control
- ▶ Automated on/off stabilization control



PERFORMANCE SPECIFICATIONS

POSTrack Absolute Accuracy¹ (RMS)

POS AV	310 SPS	310 RTX ²	310 PP-RTX ^{3,4}	310 SmartBase Post-processed ⁴
Position (m)	1.5 H	< 0.1 H	0.03 H	0.02 H
	3 V	< 0.2 V	0.06 V	0.05 V
Velocity (m/s)	0.05	0.05	0.010	0.010
Roll & Pitch (deg)	0.03	0.02	0.015	0.015
True Heading ² (deg)	0.10	0.08	0.035	0.035

POS AV	410 SPS	410 RTX ²	410 PP-RTX ^{3,4}	410 SmartBase Post-processed ⁴
Position (m)	1.5 H	< 0.1 H	0.03 H	0.02 H
	3 V	< 0.2 V	0.06 V	0.05 V
Velocity (m/s)	0.050	0.050	0.005	0.005
Roll & Pitch (deg)	0.020	0.015	0.008	0.008
True Heading ² (deg)	0.080	0.040	0.020	0.020

POS AV	510 SPS	510 RTX ²	510 PP-RTX ^{3,4}	510 SmartBase Post-processed ⁴
Position (m)	1.5 H	< 0.1 H	0.03 H	0.02 H
	3 V	< 0.2 V	0.06 V	0.05 V
Velocity (m/s)	0.050	0.050	0.005	0.005
Roll & Pitch (deg)	0.008	0.008	0.005	0.005
True Heading ² (deg)	0.070	0.040	0.008	0.008

POS AV	610 SPS	610 RTX ²	610 PP-RTX ^{3,4}	610 SmartBase Post-processed ⁴
Position (m)	1.5 H	< 0.1 H	0.03 H	0.02 H
	3 V	< 0.2 V	0.06 V	0.05 V
Velocity (m/s)	0.030	0.030	0.0050	0.0050
Roll & Pitch (deg)	0.005	0.005	0.0025 ⁵	0.0025 ⁵
True Heading ² (deg)	0.030	0.020	0.0050	0.0050

POSTrack Relative Accuracy

POS AV	310	410	510	610
Noise (deg/sqrt(hr))	0.15	< 0.1	0.02	0.005
Drift (deg/hr) ⁷	0.5	0.5	0.1	< 0.01

SYSTEM SPECIFICATIONS

Computer System

Component	Dimensions (L x W x H) mm	Weight kg	Power (incl IMU and Pilot Display)	Temperature °C	Altitude ⁸ m
POSTrack V6	179x323x68	4.0	18-34 Vdc, 110 W Max	-20 to +55	0 to 7,820
Pilot Tablet	40x159x258	1.2		-20 to +50	0 to 7,820

¹Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects

²Typical mission profile, max RMS error

³Trimble RTX service, typical airborne results, subject to regional coverage. Subscription sold separately

⁴POSTrac MMS

⁵Post-processed CenterPoint RTX, typical mission performance. Subscription sold separately

⁶May require local gravity model to achieve full accuracy

⁷Attitude will drift at this rate up to a maximum error defined by absolute accuracy in table above

⁸Unpressurized operation

⁹These IMUs require US government approvals for all exports, a Canadian export permit for all destinations outside the US, and may be subject to local export restrictions internationally. Contact your Applanix representative for further information

¹⁰These IMUs are exportable worldwide subject to statutory export declarations, and standard restrictions relating to certain international destinations. Contact your Applanix representative for further information

Inertial Measurement Unit (IMU)

Type	AV Model	Dimensions (L x W x H) mm	Operational Temperature °C	Weight kg
IMU-42 ¹⁰	POS AV 310	120x120x120 (in tophat, provided)	-45 to +55	1.25
IMU-7 ⁹	POS AV 410	95x95x107	-54 to +71	1.0
IMU-8 ⁹	POS AV 510			
IMU-64 ¹⁰	POS AV 410	120x120x110 (in tophat, provided)	-45 to +55	1.25
IMU-80 ¹⁰	POSAV 510	161x120x126	-20 to +55	1.9
IMU-57 ¹⁰	POS AV 610	179x126x127	-40 to +55 ¹¹	2.6
IMU-21 ⁹	POS AV 610	163x165x163	-40 to +70	4.49

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¹¹IMU must be at -20 °C or higher at power-on

¹²Developed under the License of European Union and European Space Agency

Global Navigation Satellite System (GNSS)

Option	Signals	Data Rate
GPS-17	GPS: L1 C/A, L2C, L2E, L5 GLONASS: L1 C/A, L1 P, L2 C/A, L2 P GALILEO ¹² : L1 BOC, E5A, E5B, E5A/BOC QZSS: L1 C/A, L1 SAIF, L2C, L5 SBAS: Simultaneous L1 C/A and L5 L-Band: OmniSTAR VBS, XP, HP and G2, Trimble CenterPoint RTX BeiDou: B1, B2	5 Hz (raw)

I/O

Ethernet (100 base-T)

Parameters Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (at IMU rate), raw GNSS data

Display Port Low rate (1 Hz) UDP protocol output

Control Port TCP/IP input for system commands

Primary Port Real-time (up to 200 Hz) TCP/IP protocol output

Secondary Port Buffered TCP/IP protocol output for data logging to external device

Logging

Parameters Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (at IMU rate), raw GNSS data

Media External: Removable 8 Gbyte Flash Disk (2 supplied)

Internal: Embedded 4 Gbyte Flash Disk for redundant logging

RS232 NMEA ASCII Output

Parameter Position (\$INGGA), Heading (\$INHDT), Track and Speed (\$INVTG), Statistics (\$INGST)

Rate Up to 50 Hz (user selectable)

RS232 High Rate Binary Output

Parameter User selectable binary messages:RTCM104, DGPS

Time, position, attitude, speed, track, PAV30 output, Yaw Drift Correction

Rate Up to 200 Hz (user selectable)

RS232 Input Interfaces

Parameter Gimbal encoder input, AUX GPS Input

(RTK, NavCom Starfire, OmniStar HP), RTCM104, DGPS Corrections Input

Rate 1 to 200Hz

Other I/O

1PPS 1 pulse-per-second Time Sync output, normally high, active low pulse

Event Input (6) Six time mark of external events. TTL pulses >1 msec width, max rate 100 Hz

SENSOR INTERFACES

3-axis Mount

Drift Correction T-AS (digital interface); PAV30 (RS232) (Requires POSOP); PAV80 (RS232) (Requires COMOP and IMUOP); GSM3000 (RS232); DSS Azimuth Mount (RS232); Z/I Mount (RS232)

Levelling Control PAV30 (RS232); PAV80 (RS232); GSM3000 (RS232); Z/I Mount (RS232)

Gimbal Encoder PAV30 (RS232); PAV80 (RS232); GSM3000 (RS232); DSS Azimuth Mount (RS232); TAS (digital interface); Z/I Mount (RS232)

Stab. Control GSM3000 (RS232); PAV30 (RS232); PAV80 (RS232); T-AS (digital interface); Z/I Mount (RS232)

LiDAR

Logging On/Off ALS40/50; Riegl Q240/560/680

FRAME CAMERA

Triggering/MEP RC20/30; TOP RMK; LMK 1000; Vexcel UCD/UCX/UCL; Generic; DiMAC

Data Interface RC20/30 (RC20 w/o data annotation, RC30 requires extended EDI interface); TOP RMK (requires TCU digital interface); LMK 1000; Vexcel UCD/UCX/UCL; Generic; DiMAC

MISSION PLANNING AND REPORTING SOFTWARE

snapView: On screen digitizing

- Import raster data from various sources and formats, including Google Earth
- Simple, intuitive and efficient digitizing of project areas

snapView: On screen digitizing

- Accepts all geographic or grid coordinates formats without conversion or calculation
- Includes a graphic viewer to visually check the correctness of the text input
- Import drawings prepared by other programs in DXF format
- Generate geophysics survey flight plans based on swath width and altitude

snapPLAN: Flight planning c/w DEM support

- Planning module used to add photo lines to digitized drawings or defined geographic areas
- Worldwide DEM support via ASTER DEM product
- Automatic stereoscopic coverage of blocks
- Prepare flight plans with hundreds of runs and thousands of photos in one single mouse click
- Interactive drawing of single strips, easily move strips and arrange until the best flight plan is achieved
- Automatically prepare pinpoint flight plans where each photo position has to conform to a given grid (geographical or map)
- Full support for line-scanner and LiDAR flight plans based on swath width and altitude
- Export flight plans via KML

snapBASE: Project management database

- Track and update the status and progress of projects
- Check the data generated during the flight and log accepted or rejected photos
- Maintain an accurate and up to date photo index of the project
- Generate film reports, progress reports, etc.
- Export areas flown via KML

snapPLOT: Printing and plotting

- Printing and plotting module used to quickly and easily prepare scaled photo indices
- Plot a professional A0 photo-index in less than 2 minutes

USER SUPPLIED EQUIPMENT

PC for Mission Planning and optional POSPac Post-processing

- Atom 1.6 GHz or equivalent (minimum)
- Intel Graphics media accelerator 500 or equivalent (minimum)
- 2 GB RAM, 32 GB HDD (minimum)
- Ethernet adapter (RJ45 100 base T), USB Port
- Windows 7

PC for Mission Planning and optional POSPac Post-processing

- Pentium 4 (32 bits) at 2 GHz or equivalent (recommended minimum)
- 1 GB RAM, 100 GB Free disk space (recommended minimum)
- 2 X USB 2.0 ports for security keys
- Internet Access (for installation, DEM download, optional SmartBase processing)
- Windows 7