POS AV™ Precision GPS/IMU Option

Airborne Hyperspectral Solutions

V5

POS AV Controller, Airborne Antenna, and IMU Shown

Source of Precision Attitude & Positional Data for Use with ITRES Airborne Hyperspectral Imagers

- Supplier: Applanix Corporation (www.applanix.com)
- Integrated GPS with Inertial Measurements & Data Logger
- Synchronized with ITRES CASI, SASI, TABI, and TASI for Direct Georeferencing

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Top: *Geocorrected CASI-1500 image mosaic (60 cm resolution) processed using precision attitude (roll, pitch, heading) inputs from a POS AV, and orthocorrected using Lidar data.*
Bottom: *Closeup of identified subset showing excellent seam alignment of multiple north-trending CASI flight lines.*

Data provided by the Joint Airborne Lidar Bathymetry Technical Center of Expertise and collected with the US Naval Oceanographic Office's CHARTS system equipped with a CASI 1500. Toronto, Canada, January 2006.

GPS/IMU Option: ApplAnix POS AV

The following third party specifications are provided as a courtesy to ITRES sensor clients. They are based on information available at the time of writing from the manufacturer's website at www.applanix.com which should be consulted as the primary source of this information.

POS AV Absolute Accuracy (RMS)

		C/A GPS	DGPS	RTK	Post-Processed
Model 310	**Position (m)**	4.0-6.0	0.5-2	0.1-0.3	0.05-0.3
	Velocity (m/s)	0.05	0.05	0.01	0.075
	Roll & Pitch (deg)	0.03	0.03	0.03	0.015
	True Heading[1] (deg)	0.10	0.08	0.07	0.035
Model 410	**Position (m)**	4.0-6.0	0.5-2	0.1-0.3	0.05-0.3
	Velocity (m/s)	0.05	0.05	0.01	0.005
	Roll & Pitch (deg)	0.015	0.015	0.015	0.008
	True Heading[1] (deg)	0.08	0.05	0.04	0.015
Model 510	**Position (m)**	4.0-6.0	0.5-2	0.1-0.3	0.05-0.3
	Velocity (m/s)	0.05	0.05	0.01	0.005
	Roll & Pitch (deg)	0.008	0.008	0.008	0.005
	True Heading[1] (deg)	0.07	0.05	0.04	0.008

[1] *Typical mission profile, max RMS error*

POS AV Relative Accuracy

	Model 310	Model 410	Model 510
Noise (deg/sqrt(hr))	0.15	0.07	0.02
Drift (deg/hr)[2]	0.5	0.5	0.1

[2] *Attitude will drift at this rate up to a max error defined by absolute accuracy shown in the table above*

Temp. Range:	IMU	-54 deg C to +85 deg C
	PCS	-20 deg C to +60 deg C
Size:	IMU	97 D x 86 H mm (3.8 D x 3.4 H inches)
	PCS	239 L x 158 W x 82 H mm (9.4 L x 6.2 W x 3.2 H inches)
Weight:	IMU	0.750 kg
	PCS	2.54 kg
Power:	20-32	Volts DC
	IMU	20 W, Max (supplied by PCS)
	PCS	30 W, Max (not including IMU)

General Specifications

IMU	GPS
200 Hz High Performance FOG Gyros, silicon accelerometers	12 channel dual frequency (L1/L2), low noise, DGPS ready, 10 Hz raw data

I/O

Ethernet (100 base-T)

Parameters	Time tag, status, position, attitude, velocity, track and speed, dynamics, performance Metrics, raw IMU data (200 Hz), raw GPS data (10 Hz)
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 (200 Hz), raw GPS data (10 Hz)
Media	External: Removable 1 Gbyte Flash Disk (2 supplied), Internal: Embedded 1 Gbyte Flash Disk for redundant logging

NMEA RS232 ASCII Output

Parameters	NMEA Standard ASCII messages: Position ($INGGA), Heading ($INHDT), Track and Speed ($INVTG), Statistics ($INGST)
Rate	Up to 50 HZ (user selectable)

RS232 High Rate Binary Output

Parameters	User selectable binary messages: Time, position, attitude, speed, track, PAV30 output, Yaw Drift Correction
Rate	Up to 200 Hz (user selectable)

RS232 Input Interfaces

Parameters	Gimbal encoder input, AUX GPS Input (RTK, NavCom Starfire, OmniStar HP), RTCM104 DGPS Corrections Input
Rate	1 to 200 Hz

Other I/O

1 PPS	1 pulse-per-second Time Sync output, normally high, active low pulse
Event Input (2)	Time mark of external events. TTL pulses > 1 msec width, max rate 100 Hz.

User Supplied Equipment

PC for POS Controller (Required for configuration)	*PC for POSPac Post-Processing Software*
▪ Pentium 90 processor (minimum) ▪ 16 MB RAM, 1 MB free disk space ▪ Ethernet adapter (RJ54 100 base T) ▪ Windows 98/2000/NT/XP	▪ Pentium 90 processor (minimum) ▪ 16 MB RAM, 1 MB free disk space ▪ Windows 2000/NT/XP

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