

Supplier Scouting Opportunity 2023-025

Item to be scouted: Inertial Navigation Systems

Item description: Systems are comprised of the following items: POS MV Computer System (PCS), Rack Mount (RM) with RTK option; Inertial Measurement Unit in IP65 "Between Decks" housing; IMU cable (8m); GNSS antenna (quantity 2); GNSS cable (10m, quantity 2); and 5-year warranty.

The system that NOAA is using now is as follows: The Applanix POS MV is a turnkey system designed and built to provide accurate position, heading, attitude, heave, and velocity data of your marine vessel and hydrographic survey equipment. POS MV blends GNSS data with angular rate and acceleration data from an IMU and heading from GPS Azimuth Measurement System to produce a robust and accurate full six degrees-of-freedom position and orientation solution.

NAICS code: 334511

Technical Information

Supplier Information

Type of supplier being sought: Equivalent Brand Supplier

Reason for scouting submission: Buy American Act Waiver Process

Summary of technical specifications and performance requirements

Describe the manufacturing processes (elaborate to provide as much detail as possible): PCS, IMU, and GNSS components are all included within one singular instrument. See datasheet uploaded to box.

Provide dimensions / size / tolerances / performance specifications for the item:

Dimensions:

Rack Mount PCS: 442 mm L x 356 mm W x 46 mm H; weight 3.9 kg; temperature -20C to +70C; humidity 10-80% RH; power AC 120/230 V, 60 Hz, auto-switching Between Decks IMU: 158 mm L x 158 mm W x 124 mm H; weight 2.5 kg; temperature -40C to +60C; IP rating IP65 GNSS antenna option 1: 178 mm diameter x 73 mm W; weight 0.45 kg; temperature -50C to +70 C; humidity 1-100% RH GNSS antenna option 2: 149 mm diameter x 99 mm W; weight 0.82 kg; temperature -40C to +70 C; humidity 0-100% RH

Other Components:

System includes ethernet input/output; serial RS232 input/output; NMEA ASCII output; high rate attitude output; auxiliary GNSS inputs; base GNSS correction inputs; digital I/O

Performance Specifications:

For full specifications see attached datasheet

List required materials needed to make the product, including materials of product components:

Please see brochure and datasheet that were uploaded to box for full available details.

Are there applicable certification requirements?: No

Are there applicable regulations?: No

Are there any other standards, requirements, etc.?: Current systems are to be returned to old supplier and be replaced with updated systems.

Additional Comments:

Several other systems were technically evaluated by the program office. None were found to be comparable or meet all requirements. Other systems evaluated were: Advanced Navigation brand BOREAS D70, BOREAS D90, CERTUS, CERTUS EVO, SPATIAL, and SPATIAL FOG; Emcore brand SDN500; Parker brand 3DM-GQ7, and 3DM-RQ1; Positioning Navigation Intelligence (PNI) brand systems included on their "Targeting & Tracking Modules Comparison Chart"; SBG Systems brand Ekinox, Ellipse, and Ellipse Micro; and Vectornav brand VN-200.

Business Information

Volume and pricing

Estimated potential business volume: Purchase of quantity 3 total units.

Estimated target price / unit cost information (if unavailable explain): Estimated \$249,587.25 total for quantity 3 units.

Delivery requirements

When is it needed by?: Delivery by 30 days after date of award.

Describe packaging requirements: Shipping not specified by program office; however shipping will be paid using Government Purchase Card.

Where will this item be shipped?: Delivery to Great Lakes Environmental Research Lab, Lake Michigan Field Station, 1431 Beach Street, Muskegon, MI 49441

Additional comments

Is there other information you would like to include?:

None.



POS MV

MAXIMIZE YOUR ROI WITH POS MV OCEANMASTER

POS MV OceanMaster is a user-friendly, turnkey system designed and built to provide accurate attitude, heading, heave, position, and velocity data of your marine vessel and onboard sensors.

POS MV is proven in all conditions, and is the georeferencing and motion compensation solution of choice for the hydrographic professional.

POS MV blends GNSS data with angular rate and acceleration data from an IMU and heading from the GPS Azimuth Measurement System (GAMS) to produce a robust and accurate full six degrees-of-freedom position and orientation solution.

Key Features

- ▶ 0.01° roll and pitch performance
- ▶ IN-Fusion 2.0 ensures optimal GNSS aiding for any given conditions
- ▶ TrueHeave - no requirement to tune filter for specific conditions, no settling time so no run in time
- ▶ High accuracy inertial measurement units featuring SmartCal
- ▶ Data time tagged to microsecond accuracy



PERFORMANCE SUMMARY

POS MV OCEANMASTER ACCURACY¹

	DGPS	Fugro MarineStar [®]	IARTK	POSPac MMS PPP	POSPac MMS IAPPK	Accuracy Following 60 s GNSS Outage
Position	0.5 - 2 m ²	Horizontal: 10 cm 95% Vertical: 15 cm 95%	Horizontal: +/- (8 mm + 1 ppm x baseline length) ³ Vertical: +/- (15 mm + 1 ppm x baseline length) ³	Horizontal: < 0.1 m Vertical: < 0.2 m	Horizontal: +/- (8 mm + 1 ppm x baseline length) ³ Vertical: +/- (15 mm + 1 ppm x baseline length) ³	~ 6 m (DGPS) ~ 3 m (RTK) ~ 2 m (PPDGNSS) ~ 1 m (IAPPK)
Roll & Pitch ⁴	0.02°	0.01°	0.01°	< 0.01°	0.008°	0.03°
Heading ⁴	0.01° with 4 m baseline 0.02° with 2 m baseline	0.01° with 4 m baseline 0.02° with 2 m baseline	0.01° with 4 m baseline 0.02° with 2 m baseline	0.01° with 4 m baseline 0.02° with 2 m baseline	0.01° with 4 m baseline 0.02° with 2 m baseline	1° per hour degradation (negligible for outages <60 s)
Heave TrueHeave™	5 cm or 5% ⁵ 2 cm or 2% ⁶	-5 cm or 5% ⁵ 2 cm or 2% ⁶	5 cm or 5% ⁵ 2 cm or 2% ⁶	-	-	5 cm or 5% ⁵ 2 cm or 2% ⁶

PCS OPTIONS

COMPONENT	DIMENSIONS	WEIGHT	TEMPERATURE	HUMIDITY	POWER
Rack Mount PCS	L = 442 mm, W = 356 mm, H = 46 mm	3.9 kg	-20 °C to +70 °C	10 - 80% RH	AC 120/230 V, 50/60 Hz, auto-switching
Small Form Factor PCS	L = 167 mm, W = 185 mm, H = 68 mm	2.5 kg	-20 °C to +60 °C	0- 100% RH	DC 10-34 V, 35 W (peak)

INERTIAL MEASUREMENT UNIT (IMU)

ENCLOSURE	DIMENSIONS	WEIGHT	TEMPERATURE	IP RATING
Between Decks	L = 158 mm, W = 158 mm, H = 124 mm	2.5 kg	-40 °C to +60 °C	IP65
Submersible	Ø100 mm (base plate Ø132 mm) X 104 mm ⁷	2.7 kg	-40 °C to +60 °C	IP68

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)

COMPONENT	DIMENSIONS	WEIGHT	TEMPERATURE	HUMIDITY
GNSS antenna (540AP)	Ø178 mm, W = 73 mm	0.45 kg	-50 °C to +70 °C	0-100% RH
GNSS Antenna (GA830)	Ø149 mm, W = 99 mm	0.82 kg	-40 °C to +70 °C	0-100% RH

ETHERNET INPUT/OUTPUT

Ethernet (10/100 base-T)
 Parameters Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data 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

SERIAL RS232 INPUT OUTPUT

5 COM Ports User assignable to: NMEA output (0-5), Binary output (0-5), Auxiliary GNSS input (0-2), Base GNSS correction input (0-2)

NMEA ASCII OUTPUT

Parameters NMEA Standard ASCII messages: Position (\$INGGA), Heading (\$INHDT), Track and Speed (\$INVTG), Statistics (\$INGST) Attitude (\$PASHR, \$PRDID), Time and Date (\$INZDA, \$UTC)
 Rate Up to 50 Hz (user selectable)
 Configuration Output selections and rate individually configurable on each assigned com port

HIGH RATE ATTITUDE OUTPUT

Parameter User selectable binary messages: attitude, heading, speed
 Rate Up to 200 Hz (user selectable)
 Configuration Output selections and rate individually configurable on each assigned com port

AUXILIARY GNSS INPUTS

Parameter NMEA Standard ASCII messages: \$GPGGA, \$GPGST, \$GPGSA, \$GPGSV
 Uses Aux input with best quality
 Rate 1 Hz

BASE GNSS CORRECTION INPUTS

Parameter RTCM V2.x, RTCM V3.x, CMR, CMR+, and CMRx input formats accepted. Combined with raw GNSS observables in navigation solution
 Rate 1 Hz

DIGITAL I/O

1PPS 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, rising or falling edge, max rate 200 Hz

USER SUPPLIED EQUIPMENT

- PC for POSView Software (Required for configuration): Pentium 90 processor (minimum), 256 MB RAM, 2 GB free disk space, Ethernet adapter (10/100 Base-T Ethernet; IEEE 802.3 standard), Windows 7 SP1, Windows 7 Embedded, Windows 8, and Windows 10
- PC for POSpac MMS Post-processing Software: Intel Pentium series 1Ghz or or faster 64-bit processor (minimum), 2GB RAM, 2.6 GB free disk space, USB Port (For Security Key), Windows 7 SP1, Windows 8.1, Windows 10

¹ Sigma unless otherwise stated
² Depending on quality of differential corrections
³ Assumes 1 m IMU-GNSS antenna offset
⁴ No range limit
⁵ Whichever is greater, for periods of 20 seconds or less
⁶ Whichever is greater, for periods of 35 seconds or less
⁷ Height excludes connector

Specifications subject to change without notice.

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