POSMV™ WaveMaster

Providing the Marine Industry with robust, reliable, and repeatable position and orientation solutions in all dynamics

POSMV WaveMaster

POSMV WaveMaster RM

SYSTEM COMPONENTS

POS Computer System (PCS)
A rugged, compact computer system contains the core POS processor and IMU interface electronics, plus two GPS receivers. The PCS provides all motion variables and timing data at high rate and/or provides motion compensation and georeferenceing data to all multibeam systems.

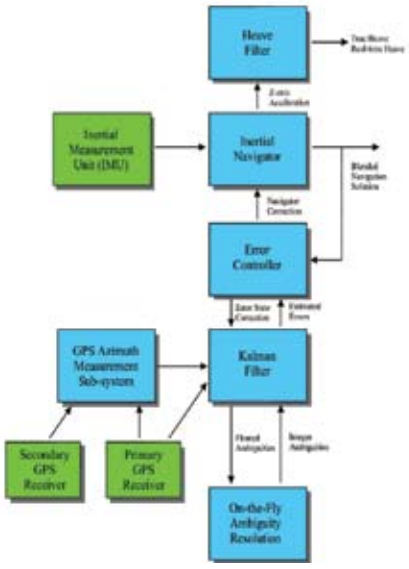
POS Inertial Measurement Unit
The system's primary sensor is a Ring Laser Gyro (RLG) manufactured by one of the world's experts in inertial technology. This high performance, low drift rate gyro ensures that the attitude data remains robust as the dynamics increase.

Primary and Secondary GPS Antennas
Dual frequency antennas for use with GAMS and RTK.

Accurate Position and Orientation Solution
POS MV™ WaveMaster maintains positoning accuracy under the most demanding conditions. With its high data update rate, the system delivers a full six degree-of-freedom position and orientation solution to provide the following:

- Position (latitude, longitude and elevation)
- Velocity (north, east and vertical)
- Attitude (roll, pitch and true heading)
- Heave (real-time & delayed)
- Acceleration Vectors
- Angular Rate Vectors

The new POS MV™ WaveMaster generates a tightly-integrated solution for survey vessels, which means the system's Inertial Navigator will provide continuous positioning information while surveying in areas where GPS reception is compromised by multipath and signal loss. Raw GPS data from as few as one satellite can now be processed directly within the WaveMaster.



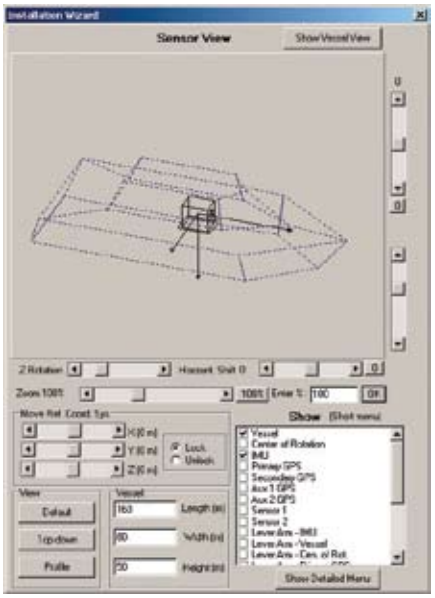
Tightly Coupled POS MV™ WaveMaster

Tightly-coupled integration offers the following advantages:

Advantage – Strengthens the system's ability to provide continuous, accurate data in areas with intermittent GPS reception
Advantage – Reduces position drift
Advantage – Enables almost instantaneous RTK re-acquisition (with internal RTK option)

WaveMaster Features and Benefits:

- Uses the latest GPS receiver technology from Trimble:
  - Maxwell™ chip technology
  - Everest™ multipath elimination technology
  - 10Hz raw observables for post-processing
  - Outstanding positioning performance and low elevation satellite tracking accuracy
- TrueHeave - Applanix's ground breaking delayed time heave processor
  - Removes processing artifacts but not real motion
  - Provides online quality measurement
- Faster CPU (700Mhz)
  - Low system loading allows for enhanced capabilities in the future
  - Runs at less than 10% of its total capacity to allow for upgrades and additional features
- TCP/IP protocol for raw data logging
  - Reliable logging of all raw data with microsecond-accurate time stamping
  - POSPac ready (for post-mission analysis)
- Firmware migration path
  - Access to new releases with new features as they become available
- New DC powered compact form-factor available
- New Graphical User Interface
  - Makes installation and setup intuitive
  - Reduces operator error



POS MV WaveMaster Graphical User Interface

APPLANIX
A TRIMBLE COMPANY

POS MV™ WaveMaster

POS MV WAVEMASTER MAIN SPECIFICATIONS (with Differential Corrections)

Roll, Pitch accuracy:	0.03° (1 sigma with GPS or DGPS) 0.02° (1 sigma with RTK)
Heave Accuracy:	5 cm or 5% (whichever is greater) for periods of 20 seconds or less
Heading Accuracy:	0.06° (1 sigma) with 1 m antenna baseline, 0.03 (1 sigma) with 2 m baseline, 0.015 (1 sigma) with 4 m baseline
Position Accuracy:	0.5 - 2 m (1 sigma) depending on quality of differential corrections 0.02 - 0.10 m (RTK) with input from auxiliary RTK or optional internal RTK receiver
Velocity Accuracy:	0.05 m/s horizontal

POS MV WAVEMASTER DURING GPS OUTAGES

Roll, Pitch accuracy:	0.04° (1 sigma)
Heave accuracy:	5 cm or 5% (whichever is greater) for wave periods of 18s or less
Heading accuracy:	Drift less than 2° per hour
Position accuracy degradation:	3 m (1 sigma) for 30 s outages <10 m (1 sigma) for 60 s outages

PHYSICAL CHARACTERISTICS

Size POS MV WaveMaster

IMU	160mm x 160mm x 102mm
PCS	281mm x 165mm x 90mm
GPS Antenna (2)	187mm x 53mm

Size POS MV WaveMaster RM

IMU	160mm x 160mm x 102mm
PCS	432mm x 89mm x 356mm
GPS Antenna (2)	187mm x 53mm

Weight

	POS MV WaveMaster	POS MV WaveMaster RM
IMU	3.6kg	3.6kg
PCS	3.0kg	5.0kg
GPS Antenna	<0.5kg	<0.5kg

Power POS MV WaveMaster

IMU	Power provided by PCS
PCS	24vdc, 50 W (peak)
GPS Antenna	Power provided by PCS

Power POS MV WaveMaster RM

IMU	Power provided by PCS
PCS	110/230 Vac, 50/60 Hz, auto-switching 80 Watt
GPS Antenna	Power provided by PCS

ENVIRONMENTAL

Temperature Range (Operating)

IMU	-40 °C to +60 °C
PCS	-20 °C to +60 °C
GPS Antenna	-40 °C to +70 °C

Temperature Range (Storage)

IMU	-40 °C to +60 °C
PCS	-20 °C to +60 °C
GPS Antenna	-40 °C to +70 °C

Humidity

IMU	0-100% RH, Ingress Protection of 66
PCS	5-90% RH, non-condensing
GPS Antenna	0-100% RH

Ethernet (100 base-T)

Parameters	Time tag, status, position, attitude, heave, velocity, track and speed, dynamics, performance metrics, raw IMU data, raw GPS data
Display Port	Low rate (1 Hz) UDP protocol output
Control Port	TCP/IP input for system commands
Data Port 1	Real-time (up to 200 Hz) UDP protocol output
Data Port 2	Buffered TCP/IP protocol output for data logging to external device

Serial RS232 I/O

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

NMEA ASCII Output

Parameters	NMEA Standard ASCII messages: Position ($INGGA, $INGGK), Heading ($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

Parameters	User selectable binary messages: attitude, heading, speed
Rate	Up to 100 Hz (user selectable)
Configuration	Output selections and rate individually configurable on each assigned com port.

Auxiliary GPS Inputs

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

Base GPS Correction Inputs

Parameter	RTCM 1, 9, 18, 19, CMR and CMR+ input formats accepted. Combined with raw GPS observables in tightly-coupled navigation solution.
Rate	1 Hz

Digital I/O

1PPS Output	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.

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