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Excellence. No Boundaries

ArSys®

Hybrid GNSS / Inertial Attitude & Heading System

The ArSys® is rugged hybrid GNSSS/Inertial system answering the needs for Heading & Attitude measurement for both static and dynamic applications.
The ArSys® utilize advanced accurate GNSS-based Heading system with 2 highly phase-accurate antennas along with 9-DoF IMU (3 x Accelerometers 3 x Gyro 3 x Magnetometer) in order to be able to provide accurate Roll/Pitch/Yaw angles in every environment.
Powerful advanced UKF (Unscented Kalman Filter) algorithm fuses information from all sensors together to bring compensated Attitude, Heading & Position data.
The combination of both technologies, the GNSS-Based heading technology which provides accurate heading information also in ferro-magnetic environment along with IMU system and proprietary advanced algorithm, provides these exceptional performance.

Main Features

- Works in Static and Dynamic environment.
- Fixed BAR or Center box with scalable antenna separation
- Heading Accuracy down to 0.05° (1σ @ 2m antennas separation)
- Roll / Pitch accuracy < 0.1°
- Update Rate up to 200 Hz
- High-Precision GNSS position accuracy of < 0.3 m
- Multi-Frequency, Multi Constellation GNSS Position & Heading.
- GNSS Strong multipath mitigation and interference rejection.
- Mil-Spec Compatibility (Design-To-Spec)
- ITAR-free

Applications

- Tracking Antenna Systems
- Armored Vehicles
- UAV/UGV
- Marine accurate Compassing & Positioning system
- Target Acquisition systems
- Radar North Finding system

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System Parameters		Value (typical)		Remarks
Attitude	Heading	< 0.20° @ 0.5m Antennas separation < 0.10° @ 1m Antennas separation < 0.05° @ 2m Antennas separation		1σ, Stabilized Kalman Filter ;
	Roll/Pitch	< 0.1°		1σ, Stabilized Kalman Filter
Resolution		0.01°		
Data Rate		100 Hz		200 Hz Optional
Stabilization Time		< 30 sec		after heading fix
Position **				
	Autonomous	< 1.2 m		1σ
	SBAS	< 0.3 m		1σ
	RTK	0.8 mm + 1ppm		1σ
	L-Band corrections (ATLAS)	< 8 cm		1σ
	GNSS outage	< 10 m (after 60 seconds)		
GNSS Receiver				
Receiver Type		L1/L2/L5 Multi-Frequency Multi-Constellation. GPS, GLONASS, BeiDou, Galileo, QZSS, IRNSS, SBAS, GPS L1CA/L1P/L1C/L2P/L2C/L5 GLONASS G1/G2/G3, P1/P2 BeiDou B1i/B2i/B3i/B10C/B2A/B2B/ACEBOC GALILEO E1BC/E5a/E5b/E6BC/ALTBOC QZSS L1CA/L2C/L5/L1C/LEX NavIC (IRNSS) L5		Optional L-band correcyions
Update Rate		10 Hz		20 Hz Optional
Sensors		**Accelerometer**	**Gyro**	
Full Scale Range		± 10g	± 500 deg/sec	others upon req.
Bandwidth		0…250 Hz	0…250 Hz	
Non Linearity		2000 ppm	200 ppm	1σ, FS
Bias	Stability	< 20 µg	0.8 °/Hr	Allan-Variance
	Repeatability ToTo	±300µg	< 20°/Hr	
	Day-to-Day	<400 µg	< 15°/Hr	
	One Year	1,500 µg	n/a	
	Over Full Temp	< 500 µg	< 60°/Hr	
	Over 20°C Span	< 150 µg	< 20°/Hr	
	Hysteresis	300 µg	< 30°/Hr	
Scale Factor				
	Repeatability	500 ppm	500 ppm	
	Over Temp p	100 ppm	500 ppm	
Random Walk		< 0.02 m/sec/√Hr	0.07 °/√Hr	
Noise density		< 20 µg /√Hz	< 0.003 °/sec/√Hz	
VRE (Vibration Rectification Error)		< 100 µg/g2	< 1 °/Hr/g2	3g RMS, 20-2000 Hz
g-Sensitivity		n/a	< 10 °/Hr/g	
Latency		< 1 mSec		
Non-Orthogonality		< 300 µRad		1σ
MisAlignment		< 1 mRad		1σ
Output Rate		Up to 1000Hz		
Communication				
Interface		RS232 (PC levels)		Optional RS422
Serial Data Rate		115,200 bps – 921,600 bps		
Data I/O Protocol		Heading, Roll, Pitch, Raw Data, GNSS data.		Other upon request Euler, Quaternion, DCM, etc
Connectors	Power/Data	D38999/24WD35PN		
	Antenna	2 x TNC (female)		
Physical		**Center box**	**0.5m BAR**	
Dimensions		177 x 143 x 54 mm	604 x 104 x 92 mm	BAR include antenna Center box Without antennas ; without connector
Weight		1.4 Kg	3.85 Kg	
Electrical				
Operating Voltage		14 – 32 VDC		
Timing output		1 PPS, accuracy 30nSec, TTL / Diff		
Power consumption		< 890mA @ 14VDC		Typical
Compliance (Design-to-Spec)				
Temperature		-40° C to +71° C	Mil-Spec 810-G Method 501.5 Procedure II	
Humidity		95% non-condensing	Mil-Spec 810-G Method 507.5 Procedure II	
Shock		30g, 11 msec ½ Sine	Mil-Spec 810-G Method 516.6 Procedure V	
Vibration		10.0 grms, 5-2000 Hz	Mil-Spec 810-G Method 514.6 Procedure I, Category 20	
Altitude		15,000 feet	RTCA/DO-160D, section 4, Par 4.6.1	
Enclosure		IP67	EN 529	
Rain		Mil-Spec 810-G Method 506.5 Procedure I		
Dust		Mil-Spec 810-G Method 510.5 Procedure I		
Salt/Fog		Mil-Spec 810-G Method 509.5		
Power Supply		MIL-STD-1275B		
EMI/RFI		MIL-STD-461C/D		
MTBF		> 50,000 hours according to Mil-HDBK 217		

** Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activity

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