



## **KI-4902S HIGH PERFORMANCE / COMPACT CARD SEANAV INS/IMU Kit**

The KI-4902S High Performance / Compact Card SEANAV INS/IMU Kit is a fully qualified sea inertial navigator that is based on Kearfott's Monolithic Ring Laser Gyros (MRLG). The SEANAV INS/IMU Kit modular architecture allows for various onboard aiding devices such as GPS, Doppler Velocity Log, Speed Log, Screwspeed, Depth Sensor, Speed of Sound Sensor and position inputs.

Typical applications include the navigation of Autonomous Underwater Vehicles (AUVs) Surface Unmanned Vehicles (SUVs) and Remotely Operated Vehicles (ROVs) also 3D Sonar and platform stabilization.

The High Performance / Compact Card kit was developed for small unmanned vehicles where high performance is required.

### *KI-4902S High Performance / Compact Card SEANAV Kit*

#### *Main Features and Capabilities:*

- Aiding Inputs:
  - GPS (Military or NMEA)
  - Doppler Velocity Log (DVL)
  - Speed Log (EM LOG)
  - Depth Sensor
  - Position Inputs
- Navigation Outputs:
  - Position (Hybrid INS/GPS/DVL)
  - Altitude (Hybrid INS/GPS/DVL)
  - Ground Speed
  - True Heading
- Stabilization Control Outputs:
  - Angular rates ( $\Delta\theta$ )
  - Linear Accelerations ( $\Delta v$ )
  - Pitch and Roll
- Communication Interfaces:
  - Multiple RS-422 Channels
  - Multiple RS-232 Channels
  - MIL-STD 1553 (Option)

# KI-4902S HIGH PERFORMANCE / COMPACT CARD SEANAV INS/IMU Kit Characteristics

KI-4902S SEANAV KIT PERFORMANCE*	
SURFACE SHIP	KI-4902S (T24 MRLG)
Position Accuracy • GPS/Log** • Log (Only)	10 m, CEP 1 nm/8hrs, TRMS
Heading Accuracy • GPS/Log** • Log (Only)	<1.0 mils, rms 0.6* secant (LAT) mils, rms
Velocity Accuracy • GPS/Log** • Log (Only)	0.05 m/sec, rms 0.3 m/sec, rms
Roll/Pitch Accuracy	0.5 mils, rms
UNDERWATER VEHICLE***	
Position Accuracy	0.1% Distance Traveled , CEP
Heading Accuracy	1.0 mils, rms
Roll/Pitch Accuracy	0.5 mils, rms

PERFORMANCE SUMMARY**		
PARAMETERS	GYRO	ACCELEROMETER
Random Walk	0.003°/√h	0.05 m/s/√h
Bias Repeatability	0.005°/h	100 μg
Scale Factor Repeatability	50 PPM	100 PPM
Axis Alignment	15 arc-second	20 arc-second
Bias Stability	0.003°/h	50 μg
Vibration Rectification	N/A	15 μg/g <sup>2</sup> typical

OPERATING RANGES*	
Acceleration	>30 g's all axes
Attitude (all axes)	unlimited
Roll, Pitch and Azimuth Rate	>300°/s
Roll, Pitch and Azimuth Accelerations	>10,000°/s <sup>2</sup>
Outputs, Digital	RS-422, RS-232, MIL-STD-1553
Cooling	Free convection
Environmental Requirements	Per MIL-E-5400
Temperature	-40°C to +55°C

PHYSICAL CHARACTERISTICS **	
Dimensions - ISA & IMU Electronics	ISA - 4.5" DIA. x 6.3" L (11.4 cm DIA X 16.0 cm L) CCA's - 5.25" x 4.25" x 0.7" (13.3 cm x 10.8 cm x 1.8 cm) HVPS - 5.25" x 2.25" x 0.7" (16.0 cm x 5.7 cm x 1.8 cm)
Weight - ISA & IMU Electronics	7.5 lb (5.0 lb ISA, <2 lb CCA's/Heatsink) 3.4 kg (2.27 kg ISA, <0.9 kg CCA's/Heatsink)
Power	+15 V, -15 V, +5 V, and < 17 Watts
Activation Time	< 5 s
Maintenance	BIT, 95% coverage
Calibration Interval	None

Notes:

\*Typical values are provided for illustration purposes and are tailorable for specific applications.

\*\*Assumes GPS aiding. (Selective Availability off)

\*\*\*Underwater vehicle performance assumes GPS aiding while aligning at surface and Sonar/Doppler aiding while under water.

*This datasheet is for reference only, Specifications are subject to change*

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