

FOGIMU

INERTIAL MEASUREMENT UNITS

FOGs | Redefining Navigation Reliability

The Kearfott Inertial Measurement Units (IMU) family employs the latest closed-loop, fiber optic gyro (FOG) and linear accelerometer technology.

These IMUs are small, lightweight, high-performance, strap-down units that are suited for reference, control, and navigation solutions for both defense and commercial applications.

FOG IMUs are available in multiple configurations to meet different price and performance requirements and complement Kearfott's navigation-grade Ring Laser Gyro IMUs.

Benefits

- Extended Performance
Option: $0.1^{\circ}/\text{hr.}$
- Low ARW: $0.02 - 0.008^{\circ}/\text{rt. hr.}$
- Scalable Bias: $0.5 - 0.1^{\circ}/\text{hr.}$
- Improved LOS Stabilization
- Reduced Jitter
- Improved CEP

IMU 52s are available in a hard-mount configuration for high bandwidth applications, or with vibration isolators for harsh vibration environments.



IMU 32



IMU 42



IMU 52-H

Proven

Kearfott IMUs have been tested and combat proven in a variety of operational applications, including rocket systems, accurate munitions, payloads, UAVs, and civilian aircraft protection systems.



Military and Civil Aircraft, Missiles, and Space Platforms

**SUITABLE FOR
HARSH VIBRATION
ENVIRONMENTS
IN DIVERSE
APPLICATIONS**

Inertial Measurement Units
With Fiber Optic Gyroscopes



Kearfott

PRODUCT SPECIFICATIONS

System Characteristics	IMU 32	IMU 42	IMU 52
Size	39.66 in ³ (650 cm ³)	27.46 in ³ (450 cm ³)	48.82 in ³ (800 cm ³)
Weight	2.16 lbs (0.98 kg)	1.85 lbs (0.84 kg)	2.20 lbs (1 kg)
Power	15 W	15 W	13 W

Operational Ranges			
Temperature	-40° to 160°F (-40° to 71°C)	-49° to 160°F (-45° to 71°C)	-40° to 160°F (-40° to 71°C)
Temperature Gradient	5.4°F/min (3°C/min)	5.4°F/min (3°C/min)	5.4°F/min (3°C/min)

Input/Output			
Power Input	+5, ±15 VDC	+5, ±15 VDC	28 VDC
Shock	± 20g 11 msec	20g 20 msec, 40g 6msec	20g 11 msec, 30g 40 msec, 40g, 8msec
Vibrations	5.6 grms, 20-2000Hz	7.3 grms, 20-2000 Hz	9.25 grms, 10-2000 Hz
Interface	SDLC, RS-422	SDLC, RS-422	SDLC, RS-422
Data Rates (Hz)	100 to 4800 Hz	100 to 4800 Hz	100 to 4800 Hz
Sync	External or Internal	External or Internal	External or Internal

Performance Characteristics	IMU 32	IMU 32-XP	IMU 42	IMU 42-XP	IMU 52	IMU 52-XP
Gyro Bias Stability	<0.5°/hr	<0.1°/hr	<0.5°/hr	<0.1°/hr	<0.5°/hr	<0.1°/hr
Gyro Angular Random Walk	0.02°/√hr	0.008°/√hr	0.02°/√hr	0.0008°/√hr	0.02°/√hr	0.008°/√hr
Gyro Scale Factor	<150 PPM	<150 PPM	<150 PPM	<150 PPM	<150 PPM	150 PPM
Gyro Dynamic Range	±1000°/sec	±1000°/sec	±2000°/sec	±1000°/sec	2000°/sec	1000°/sec
Accelerometer Bias	<300 µg	<300 µg	<300 µg	<300 µg	<300 µg	<300 µg
Accelerometer Threshold	10 µg	10 µg	10 µg	10 µg	10 µg	10 µg
Accelerometer Scale Factor	300 PPM	300 PPM	300 PPM	300 PPM	300 PPM	300 PPM
Accelerometer VRE	20 µg/g ²	20 µg/g ²	50 µg/g ²	50 µg/g ²	20 µg/g ²	20 µg/g ²
Accelerometer Range (Additional Ranges Available)	±30g	±30g	±30g	±30g	±30g	±30

IMU 42 Optional Features				
System Name	Navigation Message Rates	Control Message Rates	Accelerometer Range	Gyro Range
IMU 42-A	100 Hz	600 Hz	±30g	1000°/sec
IMU 42-B	400 Hz	N/A	±50g	1500°/sec
IMU 42-C	1200 Hz	N/A	±60g	2000°/sec
IMU 42-D	360 Hz	3600 Hz	±30g	2000°/sec
IMU 42-E	200 Hz	4800 Hz	±4.6g	Nav=162°/sec Ctrl= 200°/sec

IMU 52 Variants					
System Name	System P/N	Mounting	Input Voltage	Accelerometers	Communication
IMU 52-G	220-1013	Hard Mounted	15/5 V	Quartz Rebalanced	SDLC
IMU 52-M	220-1005	Vibration Isolation	28 V	MEMS	RS-422
IMU 52-B	220-1007	Vibration Isolation	28 V	Quartz Rebalanced	RS-422
IMU 52-H	220-1010	Vibration Isolation	28 V	Hybrid	RS-422
IMU 52-K	220-1014	Hard Mounted	28 V	Quartz Rebalanced	RS-422

ON COURSE. ON TARGET. ON POINT.

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