

Inertial Measurement Unit IMU 42 Family



Small, Lightweight, High-Performance IMUs

The Kearfott Inertial Measurement Unit (IMU) 42 family employs the latest closed-loop fiber optic gyro (FOG) and linear accelerometer technology. It is a small, lightweight, high-performance, strap-down IMU, and just like our navigation grade Ring Laser Gyro-based IMUs, the IMU 42 is suited for navigation, line-of-sight stabilization and flight control applications. It is available in multiple configurations to meet different price and performance requirements.

Kearfott's FOG IMUs have 15 years of combat-proven experience in a variety of operational applications, including rocket systems, accurate munitions, payloads, UAVs, and civilian aircraft protection systems.

Features & Benefits

- ✓ Extended Performance Option: $0.1^{\circ}/\text{hr}$.
- ✓ 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 42 Product Specifications

| System Characteristics | | |
|-----------------------------|------------------------------|------------|
| Size | 27.46 in³ (450 cm³) | |
| Weight | 1.85 lbs (0.84 kg) | |
| Power | 15 W | |
| | | |
| Operational Ranges | | |
| Temperature | -49° to 160°F (-45° to 71°C) | |
| Temperature Gradient | 5.4°F/min (3°C/min) | |
| | | |
| Input/Output | | |
| Power Input | ±15, 5 VDC | |
| Interface | SDLC, RS-422 | |
| Data Rates (Hz) | 100 to 4800 Hz | |
| Sync | External or Internal | |
| | | |
| Performance Characteristics | IMU 42 | IMU 42-XP |
| Gyro Bias Stability | <0.5°/hr | <0.1°/hr |
| Gyro Angular Random Walk | 0.02°/√hr | 0.008°/√hr |
| Gyro Scale Factor | <150 PPM | <150 PPM |
| Gyro Dynamic Range | ±2000°/sec | ±1000°/sec |
| Accelerometer Bias | <300 µg | <300 µg |
| Accelerometer Threshold | 10 µg | 10 µg |
| Accelerometer Scale Factor | 300 PPM | 300 PPM |
| Accelerometer VRE | 50 µg/g^2 | 50 µg/g^2 |
| Accelerometer Range | ±30/±50g | ±30/±50g |

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