

# INERTIAL MEASUREMENT UNIT (IMU-FI-200C)



The IMU-FI-200C DILABS Inertial Measurement Unit is the latest addition to the DILABS Advanced Inertial Measurement Units (IMU) family. Revolutionary due to its compact, self-contained strapdown, advanced tactical-grade Inertial Measurement Units, that measures linear accelerations and angular rates with three-axis tactical-grade, closed loop Fiber-Optic Gyroscopes (FOG) and three-axis high- precision MEMS accelerometers in motionless and high dynamic applications.

Officially classified as ECCN 7A994 (NLR - No License Required), IMU-FI-200C is a breakthrough, fully integrated inertial measurement solution that combines the latest closed-loop FOG and MEMS sensors technologies.

Fully calibrated, temperature compensated, mathematically aligned to an orthogonal coordinate system, the IMU contains up to 0.5 deg/hr gyroscopes and less than 2 mg bias repeatability over operational range accelerometers with very low noise and high reliability.

Continuous Built-in Test (BIT), configurable communications protocols, electromagnetic interference (EMI) protection, and flexible input power requirements make the DILABS IMU-FI-200C easy to use in a wide range of higher order integrated system applications.

### The DILABS IMU-FI-200C was designed for applications, like:

- Antenna and Line of Sight Stabilization Systems
- Passengers trains acceleration / deceleration and jerking systems
- Motion Reference Units (MRU)
- Motion Control Sensors (MCS)
- Gimbals, EOC/IR, platforms orientation and stabilization
- GPS-Aided Inertial Navigation Systems (INS)
- Attitude and Heading Reference Systems (AHRS)
- Land vehicles navigation and motion analysis
- Buoy or Racing Boat Motion Monitoring
- UAV & AUV/ROV navigation and control



### IMU-FI-200C GYROSCOPES & ACCELEROMETERS KEY PERFORMANCE

PARAMETER	IMU-FI-200C
<b>GYROSCOPES</b>	
Gyroscopes Technology	Closed-loop FOG
Gyroscopes Measurement Range	±490 deg/sec
Gyroscopes Bias repeatability over operational temperature range	0.5 deg/hr
Gyroscopes Noise – Angular Random Walk	0.025deg/√hr
<b>ACCELEROMETERS (±8 g range)</b>	
Accelerometers Technology	MEMS
Accelerometers Measurement Range	±10 g
Accelerometers Bias repeatability over operational temperature range	1.2 mg
Accelerometers – Angular Random Walk	0.015m/sec/√hr

IMU-FI-200C SPECIFICATIONS

PARAMETER	UNITS	IMU-FI-200C
Output signals		Accelerations, Angular Rates, Delta Angle, Delta Velocity, Temperature, Synchronization
Start-up time	sec	< 1
GYROSCOPES	UNITS	IMU-FI-200C
Technology		Closed-loop FOG
Measurement range	g	±490
Bandwidth (-3dB)	Hz	200
Data update rate	Hz	400 (1000 is optional)
Bias repeatability (over temperature range)	deg/hr	0.5
SF accuracy (over temperature range)	ppm	100
Noise. Angular Random Walk (ARW)	deg/√hr	0.025 (typical)
Non-linearity	ppm	50
Axis misalignment	mrاد	0.1
ACCELEROMETERS	UNITS	IMU-FI-200C
Technology		MEMS
Measurement range	g	±10
Bandwidth (-3dB)	Hz	200
Data update rate	Hz	400 (1000 is optional)
Bias in-run stability (RMS, Allan Variance)	mg	0.015
Bias repeatability (over temperature range)	mg	1.2
SF accuracy (over temperature range)	ppm	300
Noise. Velocity Random Walk (VRW)	m/sec/√hr	0.015 (typical)
Non-linearity	ppm	150
Axis misalignment	mrاد	0.2
ENVIRONMENT	UNITS	IMU-FI-200C
Mechanical shock (MIL-STD-810G)	g	40g, 11ms saw-tooth (operation) / 150g, 8ms half-sine (survival)
Vibration (MIL-STD-810G)	g RMS, Hz	7.7g, 20 – 2000 Hz
Operational and storage temperature	deg C	-40 to +71
Low pressure	Pa, min	8400, 30 (55,000 feet altitude)
Humidity	%	up to 95
MTBF (GM @+65degC, operational)	hours	55,000
Life time (operational)	years	7
Life time (storage)	years	100
ELECTRICAL	UNITS	IMU-FI-200C
Supply voltage	V DC	5
Power consumption	Watts	5.5 @ 5V
Output Interface		UART (RS-422); SDLC
Output data format		Binary
EMC/EMI/ESD		MIL-STD-461G
PHYSICAL	UNITS	IMU-FI-200C
Size	mm	D88.9 x H84.5
Weight	gram	790



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