

*Reliable Performance
Based Navigation
at all times*

LCR-110 **Inertial Reference System**



The **LCR-110** is the ideal low cost, small size, low weight **INERTIAL REFERENCE SYSTEM** for Performance Based Navigation.

Application

For operators looking for an easy and practical way to decrease operating costs, the LCR-110 improves the robustness of the aircraft's performance based navigation (PBN) capabilities eliminating the need for a classical and expensive IRS. Its tightly coupled IRS/GNSS hybridization enables aircraft autonomous integrity monitoring (AAIM) enhancing navigation performance and integrity for every aircraft class. This is a major step towards NextGen and SESAR operations by supporting Required Navigation Performance (RNP) 0.1 navigation capability worldwide, 24 hours a day.

Based on the gyrocompass grade sensors and AAIM the LCR-110 enables continuation of even critical RNP approaches after loss of GNSS data, helping the operator to reduce fuel consumption and save time. The AAIM also ensures required integrity of satellite based navigation at low level flight operations in mountainous areas important for helicopter SAR operations.

Reliability, Maintainability, Availability

The LCR-110 offers outstanding reliability which results from its mature high performance Inertial Measurement Unit (IMU).

The calculated MTBF of the LCR-110 with no forced cooling exceeds 25,000 hours.

Features and Benefits

- IRS for RNP-AR operation (compliant with FAA AC 90-101A and EASA AMC 20-26)
- Provides attitude, heading, body acceleration, angular rates, velocity and position information for primary aircraft control and guidance
- Horizontal limit (HIL) computed by Aircraft Autonomous Integrity Monitoring (AAIM) improve availability compared to pure GNSS navigation and allow continuation of RNP approaches after loss of GNSS
- Delivers 24/7 availability worldwide for oceanic flights, RNP and RNP-AR procedures
- Ensures required integrity of satellite based navigation at low level flight operations in mountainous areas
- Increases robustness against GNSS interference, spoofing and jamming
- Gyro-Compassing (North Finding) capability per ARINC 704A eliminates the need of flux valves or magnetometers
- Supports Helicopter Hover Hold Modes and Rig Approaches
- Continuous performance independent of Magnetic Sensors avoids disturbances (e.g. high latitude, helipad or ship operation)
- Features In-Flight Alignment to full IRS Mode after emergency starts, alignments on ships, extreme latitude alignments or power interrupts in air

LCR-110

Inertial Reference System

TECHNICAL DATA LCR-110

SPECIFICATIONS	
• Dimensions	278 x 102 x 128 mm
• Weight	2.85 kg
• Volume	3.6 l
• Power 28 VDC	36 W
• MTBF (calculated)	25,000 hours (no scheduled maintenance)
PERFORMANCE (95 %)	
• Pitch / Roll	0.1 deg
• True Heading	1.0 deg Typical 0.5 deg
• Alignment Time	3 to 10 min (Gyrocompassing)
• Inertial Position	2 nm/15 min
• Hybrid Position	GNSS accuracy
• Accuracy Coasting (HFOM) after loss of GNSS	0.1 nm/3 min, 0.3 nm/6 min, 0.5 nm/8 min, 1.0 nm/12 min, 4.0 nm/30 min
• Integrity Coasting (HIL) after loss of GNSS	0.1 nm/2 min, 0.3 nm/4 min, 0.5 nm/6 min, 1.0 nm/8 min, 2.0 nm/12 min
• Hybrid Velocity	0.2 kts
• AAIM	RNP 0.1, 100% availability of detection
• Angular Rates	0.02 deg/s or 0.5%
• Acceleration	5 mg or 0.5%
• Acceleration Range	± 10 g
INTERFACES	
• 6 ARINC 429 Output	6 x Inertial / Hybrid
• 6 ARINC 429 Input	Air Data, FMS, GNSS
• Discretes	17 x SGS / 6 x SAV
• Installation Data Module (Aircraft related data)	Misalignment Correction, GNSS antenna lever arms, Center of gravity lever arm, MagVar Model, Notch Filter
CERTIFICATIONS	
• ETSO / TSO	C201 (AIHI), C196a
• Software	DO-178 C Level A
• Hardware	DO-254 Level A
• Environmental	DO-160 G
• AAIM	DO-316 Appendix R

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