

CMA-2012 Doppler Velocity Sensor and Navigation System

High-Accuracy Velocity Sensor Ideally Suited for Helicopter Operations



The CMA-2012 Doppler Velocity Sensor and Navigation System represents the culmination of CMC Electronics' long of experience in airborne Doppler radar and navigation systems. It is particularly well suited for helicopter hover and low-speed operations, such as anti-submarine warfare and SAR, and for weapons targeting during tactical flight manoeuvres, where the highest accuracy velocity sensor is required to ensure mission accomplishment.

The CMA-2012's superior accuracy and performance are achieved by integrating several technologies into one compact, low weight unit. A frequency modulation/continuous wave (FM/CW) modulation technique, together with a four-beam Janus configuration, is optimized for low-speed conditions. A dynamic carrier breakthrough circuit lowers hover drift. Signal returns then undergo digital signal processing to optimize signal acquisition over marginal terrain, such as smooth water, sand or snow, and enhance tracking precision accuracy. Pitch, roll and yaw heading inputs further enhance the CMA-2012's performance during dynamic helicopter movements.

With the input of pitch, roll and heading information, the CMA-2012 can provide Doppler navigation system functions, compute present position and other navigation information, and output navigation data to CMC's or other multifunction CDUs via a digital data bus.

Extensive flight testing of the CMA-2012 has demonstrated its excellent performance. It is now in use on a variety of helicopter types, including the PAH-2 Tiger, Rooivalk AH-2A, Bell-412, Japanese OH-1, AH-1P Cobra and EH-101.

CMA-2012 Doppler Velocity Sensor and Navigation System — Specifications

FEATURES

- 13.325 GHz Frequency Modulation/Continuous Wave (FM/CW) at 20 mW
- Four-beam Janus configuration, together with FM/CW and large, effective antenna aperture
- Digital Signal Processing (DSP) for continuous spectrum analysis of signal returns
- Dynamic carrier breakthrough circuit
- Attitude rate range of up to 60 deg/sec in pitch and roll, and 100 deg/sec in azimuth
- Heading, pitch and roll inputs (optional)
- Low radiated power, typically less than 20 mW
- Tactical modes of operation, such as horizontal-beam cut-off, intermittent track, and silent
- Full-diagnostic Built-in-Test (BIT)
- Single LRU
- Low weight and small size

BENEFITS

- Excellent performance throughout speed/attitude range, with highly predictable altitude performance
- Immune to shipborne radars
- Excellent hover performance down to sea state Beaufort 1
- Greater insensitivity to precipitation
- Excellent rejection of aircraft and sling load reflections
- Enhances tracking precision accuracy
- Optimizes signal acquisition over marginal terrain, such as sand, snow or sea (to Beaufort 1/2)
- Lower hover drift, typically less than 0.7 meter per minute
- Well suited for aggressive helicopter manoeuvring
- Improves high attitude/yaw rate performance, without increasing susceptibility to false lock
- Decreases likelihood of detection
- Very low probability of detection
- Automatically validates DVS operation
- Eases installation and lowers the cost of ownership
- Minimizes impact on aircraft performance (aircraft weight, skid/wheel clearance)

SPECIFICATIONS

Accuracy (2 Sigma)	Component	Sea (Bft 1)	Land
	V_x	0.30% V_t + 0.2 kt	0.25% V_t + 0.2 kt
	V_y	0.30% V_t + 0.2 kt	0.25% V_t + 0.2 kt
	V_z	0.20% V_t + 0.2 fpm	0.20% V_t + 0.2 fpm
	(Where $V_t = \sqrt{V_x^2 + V_y^2 + V_z^2}$)		
Resolution	Better than 0.1 kt		
Acquisition	Fully automatic; typically 40 msec		
Weight	< 11 lb (5 kg)		
Size	W 13.60" (343.5 mm) x H 14.67" (372.6 mm) x D 1.95" (49.5 mm), excluding connectors		
Electrical Interface	MIL-STD-1553B; ARINC 429; digital and/or analog discretes		
Power	45 W (maximum) @ 28 VDC; 35 W typical		
Environment	MIL-STD-810		
EMI/EMC	MIL-STD-461/462 (HIRF to 200 V per per meter); lightning to DO-160C		
Reliability	10,000 hr. MTBF, ARW environment		

For more information, visit www.cmcelectronics.ca or email us at sales@cmcelectronics.ca