



ADVANCED CENTRIC SYSTEMS B.V

# HYBRID HIGH-PRECISION LAND NAVIGATION SYSTEM

## Product brochure



## **THE PROBLEM**

Battlefield orientation and accurate navigation are among the most fundamental requirements for situational awareness – which is the key to effective command and control.

Just like naval vessels at sea and aircraft in the air, ground vehicles also depend on accurate navigation to determine their own positions, reach their destinations and conduct their operations relative to the terrain and to other elements, both friendly and hostile.

The two primary navigation technologies currently in use are GPS (Global Positioning System) navigation – a method based on input from a satellite system, and INS (Inertial Navigation System) – a method based on continuous electronic computation of motion data relative to a known initial point.

The data collected and stored by the hybrid navigation system may be utilized for weapon laying.

## **THE SOLUTION**

ACS presents HHP-LNS – Hybrid High-Precision Land Navigation System.

HHP-LNS is a vehicle-mounted land navigation system that utilizes the two most widely-used navigation technologies, GPS and INS, along with Ring Laser Gyroscopes and accelerometers, to perform self-alignment and surveying.

HHP-LNS is based on the specifications of MIL-D-70789A MAPS and MIL-PRF-71185 MAPS HYBRID and implements the Kalman filtering algorithm.

HHP-LNS corrects inertial errors using internal/external GPS, odometer and ZUPT (Zero Velocity Update) input.

Compact and lightweight, HHP-LNS enables vehicles to determine their own position and navigate accurately to any destination or objective. Additionally, the system features a weapon laying mode.

## **KEY FEATURES & MAJOR ADVANTAGES**

### **Key Features & Major Advantages**

- Pinpoint INS/GPS land navigation system incorporating the Ring Laser Gyroscope (RLG) technology
- Self-alignment, surveying & alignment on the move
- Laying & BIT modes
- Kalman filtering algorithm

- Inertial error correction using internal/external GPS, odometer and ZUPT (Zero Velocity Update) input
- Compact & lightweight
- Modes of operation:
  - Align: Normal Align, Stored Heading Align, Align on the Move
  - Survey: Inertial mode (odometer exclusive ZUPT, odometer + ZUPT), integrated mode (GPS, GPS + odometer)
  - Weapon laying mode
  - Built-In Test (BIT) mode
  - Digital inertial output used for control & stabilization:
    - Horizontal position & altitude
    - Azimuth, pitch & roll
    - Angular rates
    - Velocity
  - Communication interfaces:
    - RS-422/RS-232 serial communication
    - Fast Ethernet Channel (IEEE 802.3U Standard)
- Physical characteristics:
  - Dimensions: 296mm x 170mm x 158mm
  - Weight: 8.6kg
- Electrical:
  - Power source: 24VDC (MIL-STD-1275B)
  - Power consumption: less than 40 Watts
  - Environmental compliance: MIL-STD-810F, MIL-STD-810E
- Technical Specifications
- Align
  - Normal Align: less than 1 mil RMS@1 min.
  - Stored Heading Align: 0.1 mil RMS relative to stored heading
  - Align On-the-Move: 1 mil RMS
  - Pitch, Roll: less than 0.5 mil RMS
- Survey – Odometer Mode
- Horizontal Position: 10 m CEP (for distance travelled since last position update of less than 4 km); 0.25% of distance travelled CEP (for distance travelled since last position update of more than 4 km)
- Altitude: 10 m PE (for distance travelled since last position update of less than 10 km); 0.1% of distance travelled PE (for distance travelled since last position update of more than 10 km)
- Survey – Exclusive ZUPT Mode (ZUPT every 4 minutes) or Odometer + ZUPT Mode (ZUPT every 10 minutes)
- Horizontal: 18 m CEP (for distance travelled since last position update of less than 27 km)
- Altitude: 10 m PE (for distance travelled since last position update of less than 35 km)