Troll Systems INS-200 is an ultra-fast MEMS based IMU that combines a high-sensitivity GPS receiver, 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer to calculate the precise position and orientation of an airborne vehicle relative to its altitude above the terrain. Unlike typical INS’s, Troll’s INS-200 provides the system with terrain elevation based on data provided by the National Imagery and Mapping Agency (NIMA) or other standardized digital datasets. This Digital Terrain Elevation Data (DTED) enabled INS is uniquely designed for unmanned aircraft, automated flight guidance or other precision activities involving public safety.

Troll’s INS-200 is tested and manufactured to MIL Standards. The INS-200 has a 1 sigma dynamic accuracy of better than 5mrad in pitch/roll and less than 8mrad in heading. The INS-200 incorporates aerospace grade temperature and barometric pressure sensors that can access calibration coefficient tables stored on the sensor to ensure extremely accurate measurements over the full operating range, in real-time. To eliminate the effects of variations in forces and noise, a Kalman filter uses data streams from each sensor to produce, in parallel, an ultra-low latency, statistically optimal estimate of the vehicles dead reckoning relative to the actual environment much faster than the GPS receiver can process updates.

Troll’s INS-200 features a fast 5 second start-up fix and GPS lock enabling the onboard Digital Terrain Data to react quickly to the operational environment to a ground level accuracy of 1 meter. The INS-200 supports industry standard protocol and incorporates serial or Ethernet interface connections. Optionally the DTED terrain maps can be used to support many applications, including line-of-sight analyses, terrain profiling and mission planning/rehearsal.
# Troll’s MEMS INS

Featuring Digital Terrain Elevation Data (DTED)

## Navigation Specifications
- **Position Accuracy:** 2.5 m RMS Horizontal / 5 m RMS Vertical
- **Velocity Accuracy:** ±0.1 m/s
- **Static Accuracy (heading):** 2.0 °
- **Static Accuracy (pitch/roll):** 0.5 °
- **Dynamic Accuracy (heading):** 0.75 °
- **Dynamic Accuracy (pitch/roll):** 0.25 °
- **Angular Resolution:** < 0.05 °
- **Repeatability:** < 0.2 °
- **Maximum Output Rate:** 200 Hz

### Gyro Specifications
- **Range:** ±2000 °/s
- **In-Run Bias Stability:** < 10 °/hr
- **Linearity:** < 0.1 % FS
- **Noise Density:** 0.005 °/s/√Hz
- **Bandwidth:** 256 Hz
- **Alignment Error:** ±0.05 °

### Accelerometer Specifications
- **Range:** ±16 g
- **Linearity:** < 0.5 % FS
- **Noise Density:** 0.4 mg/√Hz
- **Bandwidth:** 260 Hz
- **Alignment Error:** ±0.05 °

### Magnetometer Specifications
- **Range:** ±2.5 Gauss
- **Linearity:** < 0.1 %
- **Noise Density:** 140 μGauss/√Hz
- **Bandwidth:** 200 Hz
- **Alignment Error:** ±0.05 °

### GPS Specifications
- **Receiver Type:** 50 Channels, L1 Freq - GPS C/A Code
- **Solution Update Rate:** 5 Hz
- **Time-to-First-Fix:** Cold/Warm Start: 36 s - Hot Start: < 1 s
- **Altitude Limit:** 50,000 m
- **Velocity Limit:** 500 m/s

### Pressure Sensor Specifications
- **Range:** 10 to 1200 mbar
- **Resolution:** 0.042 mbar
- **Accuracy:** ±1.5 mbar
- **Error Band:** ±2.5 mbar
- **Bandwidth:** 200 Hz

### Electrical Specifications
- **Input Voltage (Rugged):** 7 V to 32 V
- **Current Draw:** 100 mA @ 24 V
- **Digital Interface (Rugged):** Serial, RS-232/422 Ethernet 10/100

### Physical Specifications
- **Size:** 4” L x 2” W x 1.16” H
- **Weight:** 6.24 oz (177g)
- **GPS Antenna Connector:** SMA

### Environment Specifications
- **Operating and Storage Temp:** -40°C to +85°C

Visit us at our website for product and corporate information sessions. See video imagery of this system.

www.TROLLSYSTEMS.com

Specifications subject to change without notice.

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*Photo Courtesy of U.S. Army*