Certus Evo is a ruggedized miniature GPS aided inertial navigation system and AHRS that provides accurate position, velocity, acceleration and orientation under the most demanding conditions. It combines ultra high accuracy temperature calibrated MEMS accelerometers, gyroscopes, magnetometers and a pressure sensor with a dual antenna RTK GNSS receiver. These are coupled in a sophisticated fusion algorithm to deliver accurate and reliable navigation and orientation.

**FEATURES**

**MULTI CONSTELLATION RTK**
Certus Evo contains a dual frequency RTK GNSS receiver that provides up to 8mm accuracy positioning and supports all of the current and future satellite navigation systems, including GPS, GLONASS, GALILEO, BeiDou and QZSS.

**ADVANCED FILTER**
Certus Evo contains Advanced Navigation’s revolutionary sensor fusion filter. The filter is more intelligent than the typical extended kalman filter and is able to extract significantly more information from the data by making use of human inspired artificial intelligence. It was designed for control applications and has a high level of health monitoring and instability prevention to ensure stable and reliable data.

**MULTI-PROTOCOLS AND INTERFACES**
Certus Evo features multiple interfaces including Ethernet, CAN, RS232, RS422 and GPIOs. Certus Evo supports all the industry standard protocols including NMEA 0183, NMEA 2000, TSS, PASHR, Simrad as well as a wide variety of proprietary protocols.

**DUAL ANTENNA HEADING**
Certus Evo features dual antenna moving baseline RTK. This allows it to provide highly accurate heading while both stationary and moving. It is an excellent choice for applications where magnetic heading is not usable due to interference or where additional accuracy is required. An added benefit is the ability to accurately measure vehicle slip angle.

**RELIABILITY**
Certus Evo’s precision marine grade aluminium enclosure is waterproof and dirtproof to the IP67 standard and shockproof to 2000g, allowing it to be used in the most extreme conditions. A sophisticated venting system allows the unit to measure air pressure whilst keeping water out. Its minimal size, weight and power requirements allow for easy integration into almost any system. The hardware is protected from reverse polarity, overvoltage, surges, static and short circuits on all external interfaces. The GNSS contains RAIM, which excludes both malfunctioning, and tampered satellite signals.

**PERFORMANCE**

- 0.03 ° Roll and Pitch
- 0.05 ° Heading
- 8 mm RTK Positioning
- 0.4 °/hr MEMS Gyroscope
- 1000 Hz Update Rate
- 2000 g Shock Limit
Certus Evo contains a GNSS disciplined oscillator that can act as the primary time source within a distributed time system, enabling access to ultra-accurate system time using PTP or NTP network time sync. Certus Evo also has a high-accuracy 1PPS and frequency output.

**Internal Data Logging**
Certus Evo contains 256GB internal storage, allowing the user to log up to 1 year of navigation data without a requirement for any external systems or accessories.

**Hardware**
- **Operating Voltage**: 9 to 36 V
- **Input Protection**: > 40 to + 100 V
- **Power Consumption (typical)**: 2.64 W
- **Hot Start Battery Capacity**: > 48 hrs
- **Hot Start Battery Charge Time**: 30 mins
- **Hot Start Battery Endurance**: > 10 years
- **Operating Temperature**: -40 °C to 85 °C
- **Environmental Protection Marking**: IP67
- **MTBF**: 140,000 hrs
- **Shock Limit**: 2000 g
- **Vibration Limit**: 8 g
- **Dimensions (Enclosed)**: 78 x 115 x 44 mm
- **Weight (Enclosed)**: 300 grams

**Communication**
- **Interface**: Ethernet RS232 / RS422 CAN
- **Speed**: 100Mbit
- **Protocol**: AN Packet Protocol or NMEA
- **Peripheral Interface**: 2x GPIO
- **GPIO Level**: 5 V or RS232
- **GPIO Functions**: 1PPS input / output, Odometer, Stationary, Air data input, NMEA input, Novatel GNSS input, Trimble GNSS input, AN Packet Protocol input / output, CAN / CANopen, Event trigger

**Navigation**
- **Horizontal Position Accuracy**: 1.2 m
- **Vertical Position Accuracy**: 2.0 m
- **Horizontal Position Accuracy (with SBAS)**: 0.5 m
- **Vertical Position Accuracy (with SBAS)**: 0.8 m
- **Horizontal Position Accuracy (with RTK or Kinematica PPK)**: 0.008 m
- **Velocity Accuracy**: 0.007 m/s
- **Roll & Pitch Accuracy**: 0.03 °
- **Heading Accuracy (Im Antenna Separation)**: 0.05 °
- **Roll & Pitch Accuracy (Kinematica post processing)**: 0.01 °
- **Heading Accuracy (Kinematica post processing)**: 0.01 °
- **Slip Accuracy**: 0.1 °
- **Heave Accuracy (whichever is greater)**: 5 % or 0.05 m
- **Range**: Unlimited
- **Internal Filter Rate**: 1000 Hz
- **Output Data Rate**: 1000 Hz

**Sensors**
- **ACCELEROMETERS**
  - **Range**: ± 10 g
  - **Bias Instability**: 8 µg
  - **Initial Bias**: < 1 mg
  - **Initial Scaling Error**: < 0.03 %
  - **Scale Factor Stability**: < 0.04 %
  - **Non-linearity**: < 0.05 %
  - **Cross-axis Alignment Error**: < 0.05 °
  - **Noise Density**: 12 µg/√Hz
  - **Bandwidth**: 290 Hz
- **GYROSCOPES**
  - **Range**: ± 475 °/s
  - **Bias Instability**: 0.2 °/hr
  - **Initial Bias**: < 8 °/s
  - **Initial Scaling Error**: < 0.02 %
  - **Scale Factor Stability**: < 0.03 %
  - **Non-linearity**: < 0.05 %
  - **Cross-axis Alignment Error**: < 0.05 °
  - **Noise Density**: 7 °/√hr/√Hz
  - **Bandwidth**: 210 µg/√Hz
- **MAGNETOMETERS**
  - **Range**: ± 8 G
  - **Bias Instability**: < 0.07 %
  - **Initial Bias**: < 0.09 %
  - **Initial Scaling Error**: < 0.08 %
  - **Scale Factor Stability**: < 0.09 %
  - **Non-linearity**: < 0.09 %
  - **Cross-axis Alignment Error**: < 0.09 °
  - **Noise Density**: 210 µG/√Hz
  - **Bandwidth**: 110 Hz