ADVANCED NAVIGATION

CERTUS
MEMS GNSS/INS

Certus combines temperature calibrated accelerometers, gyroscopes, magnetometers and a pressure sensor with a dual antenna GNSS receiver.

These are coupled in an AI based fusion algorithm to deliver accurate and reliable navigation data. It features low SWaP-C (Size, Weight, Power and Cost), internal data logging and multiple communication interfaces for easy integration.

Certus is available in both OEM and rugged packages, and comes standard with license free 10 mm RTK position accuracy.

PERFORMANCE

- 0.1 ° Roll and Pitch
- 0.1 ° Heading
- 10 mm RTK Positioning
- 3 °/hr MEMS Gyroscope
- 1000 Hz Update Rate

KEY FEATURES

- Dual Antenna Heading
- Free Multi-Constellation RTK
- Ethernet, CAN, RS232, etc.
- Internal Data Logging
- OEM or Rugged options

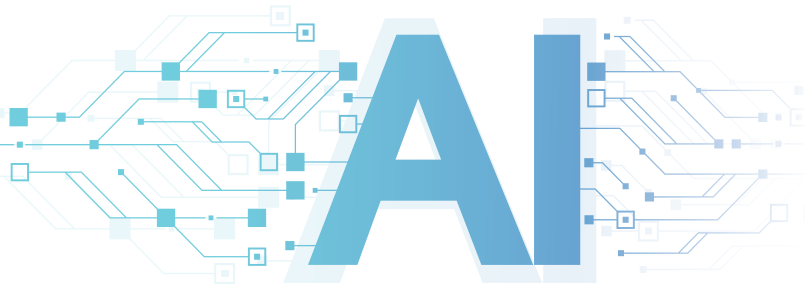
APPLICATIONS

AIR
- UAV Navigation
- Georeferencing
- Camera Pointing

LAND
- Vehicle Navigation
- Georeferencing
- Antenna Targeting

SEA
- Hydrography
- Marine Navigation

FEATURES



AI NAVIGATION ALGORITHM

Certus features Advanced Navigation's revolutionary AI neural network sensor fusion algorithm.

This provides accuracy of up to 10 times that of a traditional kalman filter.

It was designed for control applications and has a high level of health monitoring and instability prevention to ensure stable and reliable data.

HIGH PERFORMANCE MEMS

Certus contains high performance MEMS sensors that are put through Advanced Navigation's intensive 8 hour temperature calibration process. This provides the highest accuracy possible from this sensor class and outputs consistent accuracy over the full temperature range from -40°C to 85°C.

DUAL ANTENNA HEADING

Certus contains a dual frequency RTK GNSS receiver that provides up to 10 mm accuracy positioning and supports all of the current and future satellite navigation systems, including GPS, GLONASS, GALILEO, BeiDou and QZSS.

Dual antenna heading provides high accuracy heading that is not impacted by magnetic interference and has no motion requirements.

TIME SYNCHRONISATION

Certus 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 also has a high-accuracy 1PPS and frequency output.

MULTI CONSTELLATION RTK

Certus features multiple interfaces including Ethernet, CAN, RS232, RS422 and GPIOs.

Certus supports all the industry standard protocols including NMEA 0183, NMEA 2000, TSS, PASHR, Simrad as well as a wide variety of proprietary protocols.

It feaures a rich web UI and 256GB of internal logging.

SPECIFICATIONS

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)	0.01 m
Vertical Position Accuracy (with RTK or Kinematica PPK)	0.015 m
Velocity Accuracy	0.005 m/s
Roll & Pitch Accuracy	0.1 °
Heading Accuracy (1m Antenna Separation)	0.1 °
Roll & Pitch Accuracy (Kinematica post processing)	0.03 °
Heading Accuracy (Kinematica post processing)	0.06 °
Slip Accuracy	0.1 °
Heave Accuracy	5 % or 0.05 m
Range	Unlimited
Hot Start Time	500 ms
Internal Filter Rate	1000 Hz
Output Data Rate	Up to 1000Hz

GNSS

Model	Advanced Navigation Aries
Supported Navigation Systems	GPS L1, L2 GLONASS L1, L2 GALILEO E1, E5b BeiDou B1, B2
Supported SBAS Systems	WAAS EGNOS MSAS GAGAN QZSS
Update Rate	Up to 20 Hz
Hot Start First Fix	3 s
Cold Start First Fix	30 s
Horizontal Position Accuracy	1.2 m
Horizontal Position Accuracy (with SBAS)	0.5 m
Horizontal Position Accuracy (with RTK)	0.01 m
Velocity Accuracy	0.05 m/s
Timing Accuracy	20 ns
Acceleration Limit	4 g

HARDWARE

Operating Voltage (Rugged)	9 to 36 V
Operating Voltage (OEM)	9 to 30 V (or 5 V)
Input Protection (Rugged only)	-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 (Rugged only)	IP67 MIL-STD-810G
MTBF	140,000 hrs
Shock Limit	2000 g
Dimensions (Rugged)	78 x 115 x 34 mm
Dimensions (OEM)	75 x 101.5 x 24 mm
Weight (Rugged)	280 grams
Weight (OEM)	110 grams

COMMUNICATION

Interfaces (Rugged)	Ethernet, RS232 / RS422, CAN
Interfaces (OEM)	Ethernet, UART, CAN
Speed	100 Mbit 4800 to 4M baud serial
Protocol	AN Packet Protocol NMEA0183 NMEA2000
Peripheral Interface	2x GPIO 1x Auxiliary RS232
GPIO Level	5 V or RS232
GPIO Functions	1PPS input / output Odometer Stationary Air data input NMEA input / output Novatel GNSS input Trimble GNSS input AN Packet Protocol CAN / CANopen Event trigger

SENSORS

SENSOR	ACCELEROMETERS	GYROSCOPES	MAGNETOMETERS	PRESSURE
Range (dynamic)	± 2 g ± 4 g ± 16 g	± 250 °/s ± 500 °/s ± 2000 °/s	± 2 G ± 4 G ± 8 G	10 to 120 KPa
Bias Instability	20 µg	3 °/hr	-	10 Pa
Initial Bias	< 5 mg	< 0.2 °/s	-	< 100 Pa
Initial Scaling Error	< 0.06 %	< 0.04 %	< 0.07 %	-
Scale Factor Stability	< 0.06 %	< 0.05 %	< 0.09 %	-
Non-linearity	< 0.05 %	< 0.05 %	< 0.08 %	-
Cross-axis Alignment Error	< 0.05 °	< 0.05 °	< 0.05 °	-
Noise Density	100 ug/√Hz	0.004 °/s/√Hz	210 uG/√Hz	0.56 Pa/√Hz
Bandwidth	400 Hz	400 Hz	110 Hz	50 Hz

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