Apogee Air & Land Series

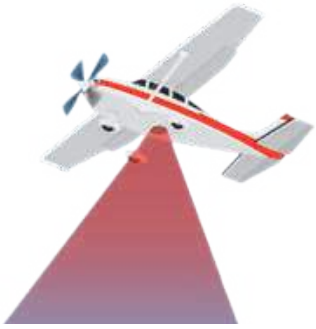
APOGEE SERIES makes high accuracy affordable for all surveying companies. On the fields of hydrography, mobile mapping, or remote sensing, the Apogee joins robustness, simplicity to high performance.

SBG SYSTEMS

HIGH QUALITY
HIGH ACCURACY

SBG SYSTEMS manufactures high quality, high accuracy inertial navigation systems from the design to the production. The Apogee benefits from our high level of expertise in integrated design, IMU calibration, testing, and filtering.

Highly Accurate



ATTITUDE AND POSITION - AEROSPACE APPLICATIONS

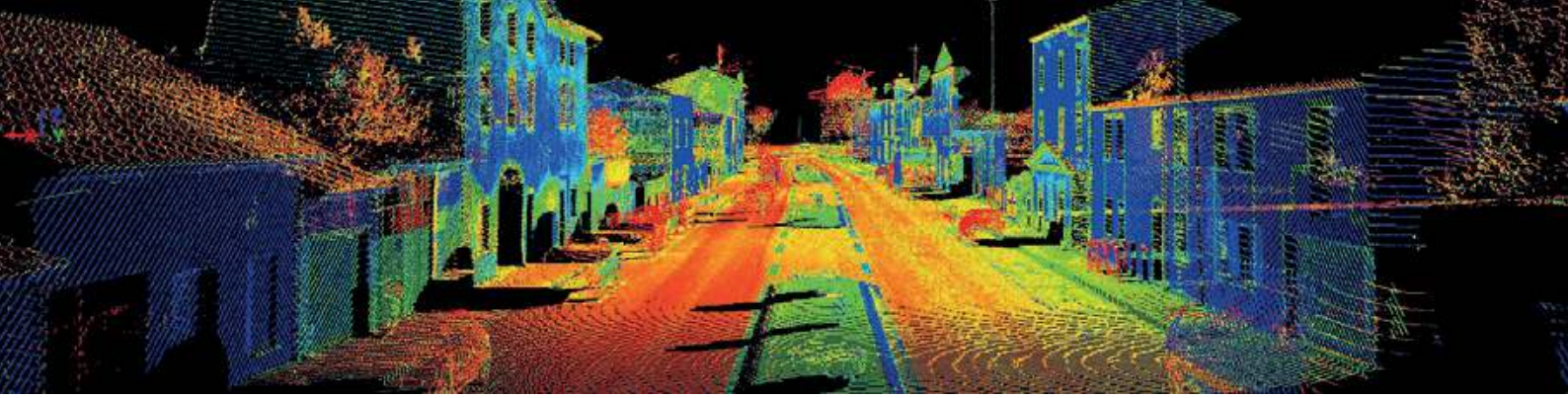
	GNSS L1/L2/L5	RTK*	PPK**
Roll/Pitch	0.01°	0.008°	0.005°
Heading - Dual antenna (2m baseline)	0.02°	0.02°	0.01°
Heading - Dual antenna (4m baseline)	0.01°	0.01°	0.01°
Position (X/Y)	1.0 m	0.01 m + 0.5 ppm	0.01 m + 0.5 ppm
Altitude (Z)	1.0 m	0.015 m + 1 ppm	0.015 m + 1 ppm

ATTITUDE AND POSITION - LAND APPLICATIONS***

	GNSS L1/L2/L5	RTK*	PPK**	RTK 60 sec outage	PPK 60 sec outage
Roll/Pitch	0.01°	0.008°	0.005°	0.012°	0.008°
Heading - Single antenna	0.03°	0.02°	0.01°	0.06°	0.025°
Position (X/Y)	1.0 m	0.01 m + 0.5 ppm	0.01 m + 0.5 ppm	0.5 m	0.1 m
Altitude (Z)	1.0 m	0.015 m + 1 ppm	0.015 m + 1 ppm	0.3 m	0.05 m

**Real Time Kinematic*
*** Post-processing Kinematic*
****With odometer aiding*

RMS values for typical survey trajectories
Performance may be affected by atmospheric conditions, signal multipath, and satellite geometry.
All specifications subject to change without notice.



Precise Trajectory & Direct Georeferencing

- ACCURATE TRAJECTORY DURING GNSS OUTAGES
- VERY LOW NOISE GYROSCOPES
- LATEST GENERATION OF TRI-FREQUENCY GNSS RECEIVER
- INTERNAL 8 GB DATA RECORDER
- SYNCHRONIZE SURVEY DEVICE WITH PTP SERVER

LAND MOBILE MAPPING

Robust position in urban canyons, forest, tunnels thanks to:

- Continuous fusion with Inertial and odometer data
- Real time and off-line RTK corrections
- Post-processing software
- Tight GNSS integration for optimal position in multipath environments

AERIAL SURVEY

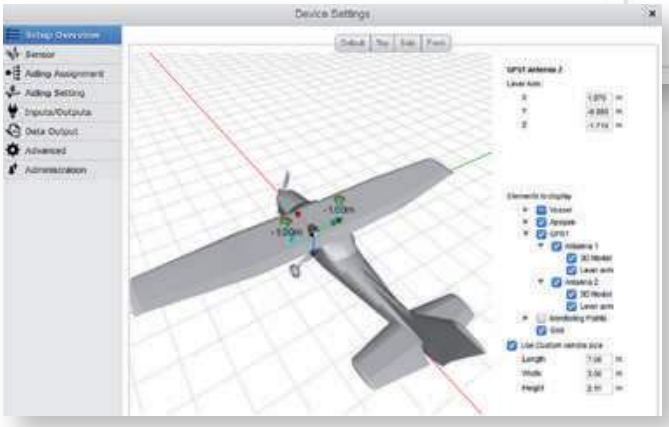
High accuracy real-time external orientation and direct georeferencing thanks to:

- RTK corrections
- Low latency (3 ms)
- High resistance to vibrations (can be used on helicopter)
- Post-processing software

Modern and Easy-to-use Inertial Sensors

WEB INTERFACE

Connect your sensor and configure it throughout the intuitive web interface.



3D VIEW

The new 3D View helps you to check your mechanical installation, especially your sensor position, your alignments, and lever arms.

Easy Integration, Precise Synchronization

COMPACT, LIGHTWEIGHT & LOW POWER

ETHERNET, RS-232, RS-422, CAN PROTOCOLS

ACCURATE UTC TIME STAMPING (1 µs) & PTP FOR TIME SYNCHRONIZATION

UP TO 5 EVENT INPUT MARKERS

WHY MEMS TECHNOLOGY?

- » Low-power consumption
- » Cost-effective
- » Highly Robust
- » Compact and Light-weight

Versatile Product Line

Model	Apogee-E Externally-aided INS	Apogee-D INS/GNSS
Roll, Pitch, Heading	●	●
Navigation	●	●
GNSS receiver	Connect to any external survey-grade GNSS receiver	Single or Dual Antenna L1/L2/L5 GPS, GLONASS, GALILEO, BEIDOU
RTK		●
Post-processing (raw data)**		●
External Aiding	Up to two external GNSS receivers, Odometer (DMI)	

**Subscription available from third party PPP service provider*
***Raw data are compatible with Qinertia post-processing software*

● *Standard* ○ *Option*

CONTINUOUS POSITION

Continuous fusion of inertial data with GNSS information stabilizes the position output, effectively eliminating the impact of multipath and signal outages, when the vehicle is passing in dense urban areas for example.

Specifications

All parameters apply to -20 to 60°C temperature range, unless otherwise stated. Full specifications can be found in the Apogee Hardware Manual available upon request.

PHYSICAL CHARACTERISTICS

Model	Apogee-E	Apogee-D
Weight	< 690 grams 1.52 pounds	< 900 grams 1.98 pounds
Dimensions (L x W x H)	130 x 100 x 58 mm 5.12 x 3.94 x 2.28 ''	130 x 100 x 75 mm 5.12 x 3.94 x 2.95 ''
Consumption	< 3 W	< 5 W Single antenna < 6 W Dual antenna
Supply	9 to 36 VDC	9 to 36 VDC

ENVIRONMENTAL

IP rating Apogee- A/D/E	IP68 (Aluminium)
Specified temperature	-20 to 60 °C / -4 to 140 °F
Operating temperature	-40 to 71 °C / -40 to 160 °F
MTBF (computed)	50,000 hours
Operating vibrations	20 Hz to 2 kHz as per MIL-STD-810G Accelerometer 10 g: 8 g RMS

All specifications subject to change without notice.

INTERFACE

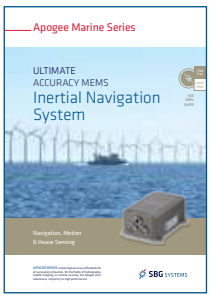
Aiding (input)	2x GNSS, RTCM, Odometer
Protocols	Output: NMEA, ASCII, Binary, TSS, Simrad Input: NMEA, Trimble, Novatel, Septentrio, Hemisphere, veripos, Fugro, PD0, PD6
Output rate	0.1 to 200 Hz
Logging Capacity	8 GB or 48 h @ 200 Hz
Serial RS-232/422	Model D - 2 outputs / 4 inputs Model A/E - 3 outputs / 5 inputs
Ethernet	Full Duplex (10/100 base-T) PTP Grand Master Clock NTRIP v1/v2 client
CAN	1 CAN 2.0 A/B bus up to 1 Mbit/s
Pulses	Inputs: PPS, Event marker up to 1 kHz Outputs: SyncOut, Trigger, PPS 5 inputs / 2 outputs

SENSOR PERFORMANCE

	Accelerometers	Gyroscopes
Measurement range	10 g	200 °/s
Bias in-run instability	< 30 µg	< 0.08 °/hr
Random walk	< 30 µg/√Hz	< 0.012 °/√hr

SBG Systems is a leading supplier of MEMS-based inertial motion sensing solutions. The company provides a wide range of inertial solutions from miniature to high accuracy. Combined with cutting-edge calibration techniques and advanced embedded algorithms, SBG Systems products are ideal solutions for industrial & research projects such as unmanned vehicle control, surveying applications, antenna tracking, and camera stabilization.

PRODUCTS



Apogee Marine

Ekinox Series

Qinertia

VIDEO

Apogee Series

SBG Systems EMEA (Headquarters)
Phone: +33 1 80 88 45 00
E-mail: sales@sbg-systems.com

SBG Systems North America
Phone: +1 (657) 845 1771
E-mail: sales.usa@sbg-systems.com

SBG Systems Singapore
E-mail: sales.asia@sbg-systems.com

www.sbg-systems.com