

# Ekinox INS

## TACTICAL GRADE MEMS Inertial Navigation System



ITAR  
Free

0.05°  
RMS



AEROSPACE



GROUND

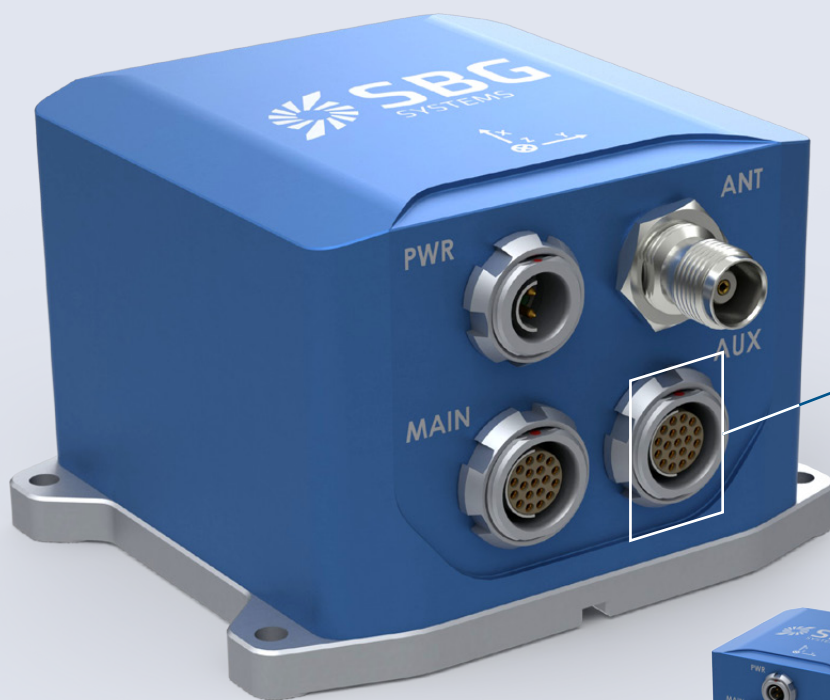


MARINE

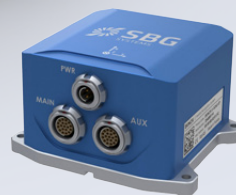
**EKINOX SERIES** R&D specialists usually compromise between high accuracy and price. The Ekinox Series has been designed to bring robust and cost-effective MEMS solutions to the FOG technology's level of accuracy. Ekinox Series opens a new world of opportunities.



# Ekinox INS - Precisely fits your demanding projects



Model N with internal GNSS receiver



Model E

## UP TO 4 EQUIPMENTS SIMULTANEOUSLY CONNECTED

- » Navigation: RTK GPS/GNSS, SBL, USBL
- » Heading: Dual Antenna GPS/GNSS, Magnetometer
- » Velocity: Odometer, DVL, EM Log

## KEY FEATURES

- » 0.05° RMS 3D Attitude Accuracy over 360°
- » 2 cm RTK GNSS Position @ 200 Hz
- » 5 cm Real-time Auto Adjusting Heave
- » Internal Data Logger
- » Web Configuration
- » Real-time Data Fusion

Ekinox INS is a MEMS-based Inertial Navigation System which achieves tactical grade accuracy in a compact and affordable package. It combines an Inertial Measurement Unit (IMU), a high-end L1/L2 GNSS receiver (model N), and runs an on-board enhanced Extended Kalman Filter (EKF). Created to achieve the best accuracy for every application, Ekinox INS integrates data from various aiding equipments such as GPS, Odometer, USBL, etc.

## OUTSTANDING PERFORMANCE FOR A COST-EFFECTIVE SOLUTION

Ekinox INS takes the best from the proven and maintenance free MEMS technology by a selection of high-end components and an extended dynamic temperature calibration. To achieve the best performance in every environment, complex algorithms have been written from thousands of hours of field data, recorded in each main application. Ekinox INS embeds the most powerful data fusion engine of its class to finely combine real-time inertial data with aiding information. Compromise is no longer required between high performance and cost.

## PERFECTLY FITS YOUR SPECIFIC APPLICATION

Ekinox INS hardware has been designed to support each industry's specifics such as protocol, data logger, and connectivities. To achieve the best performance in your project, specific error models have been implemented. Throughout the embedded web interface, you simply choose your application (ex: automotive), your connected aiding equipment (ex: Novatel GPS), and your environment constraints (ex: Urban Canyon); your Ekinox INS is ready to unveil its full potential.

## ROBUST DESIGN FOR HARSH ENVIRONMENTS

At SBG Systems, we pay attention to every manufacturing detail to offer a reliable solution with high data integrity. With its IP68 aluminium enclosure, its galvanic isolated connectors, and its extensive temperature calibration, Ekinox INS is the ideal solution for demanding applications. To ensure the best quality, each Ekinox INS is intensively tested and shipped with its own calibration report.

# Applications

## AEROSPACE



- Mid-sized & large UAV
- Avionics
- Lidar & payload
- Flight data recorder

### Benefits

- Ready to use (internal GPS)
- Designed for harsh environments
- Temperature calibrated from -40° to 85°C
- MIL-STD-810G
- Robust IP68 enclosure

## GROUND

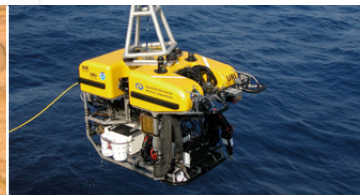


- Car motion
- Unmanned Ground Vehicle
- Camera and 3D scanner
- Machine Control

### Benefits

- Anti-jamming techniques
- Dead reckoning navigation with odometer aiding
- 200 Hz Output rate
- 48 hours data logger
- Ethernet & CAN connectivity

## MARINE



- ROV & AUV
- Sonar, Lidar, camera, buoy
- Performance sailing
- Ship motion monitoring

### Benefits

- Real-time auto adjusting heave on 4 monitoring points
- NMEA protocol
- Dual antenna GPS heading
- Handle magnetic disturbances
- Ethernet & Web interface

## PAYLOADS

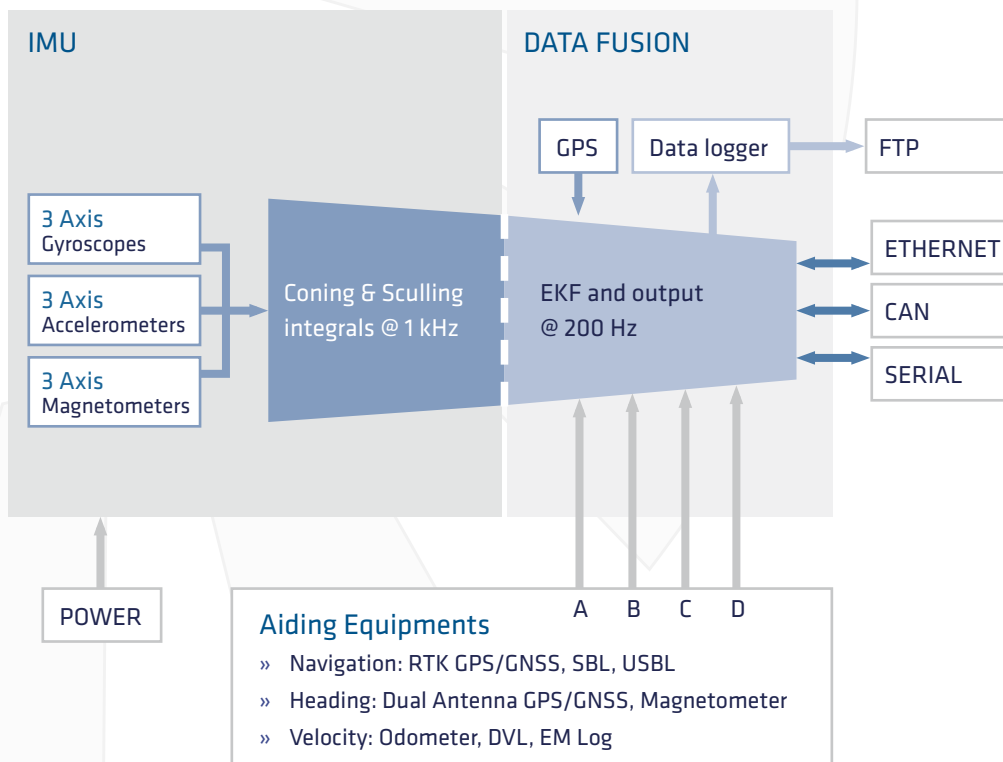


- Gyro-stabilized camera
- SATCOM antenna
- Targeting system
- Crane orientation

### Benefits

- 200 Hz Output rate
- 20 Nano-sec GPS UTC sync
- Low noise (<0.03°)
- 3 ms Latency
- Drift-free heading without magnetometer

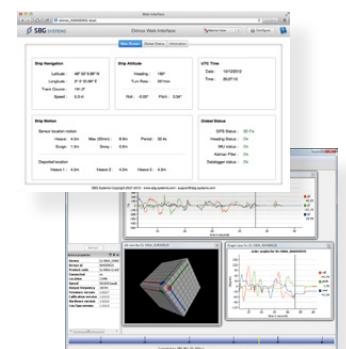
# A cutting-edge architecture



## CONFIGURATION REAL-TIME DISPLAY REPLAY & ANALYSIS

Integration is made easy through our intuitive embedded web interface and the cutting-edge sbgCenter analysis software.

### Embedded Web Interface



sbgCenter



## POSITION & ATTITUDE

Outage Duration	Positioning Mode	Horizontal Position (m)	Roll, Pitch (°RMS)	Heading (°RMS)
0 seconds	SP	1.20	0.05	0.1
	RTK	0.02	0.05	0.1
	Velocity	-	0.05	0.1
10 seconds	SP	2.0	0.1	0.15
	RTK	0.2	0.1	0.15
	Velocity	0.05 %	0.1	0.15
30 seconds	SP	8	0.2	0.2
	RTK	5	0.2	0.2
	Velocity	0.1 %	0.2	0.2

## HEAVE

Accuracy	5 cm or 5 %	Velocity aided during maneuvers
Period	0 to 25 s	Real-time auto adjusting heave

## PHYSICAL CHARACTERISTICS

	Model N	Model E
GPS	L1/L2 GNSS with 1 cm RTK	-
Weight	<450 grams < 0.99 pounds	<400 grams <0.88 pounds
Dimensions (L x W x H)	10 x 8.6 x 6.4 cm 3.9 x 3.4 x 2.5 "	10 x 8.6 x 5.8 cm 3.9 x 3.4 x 2.2 "
Power Consumption	<5 W	<3 W
Supply Voltage	9 to 36 VDC	9 to 36 VDC

## INTERFACE

Aiding Sensors	2x GPS, RTCM, Align for GPS true heading, Odometer, DVL, USBL, Depth, EM log, External Magnetometer, User Inputs
Protocols	NMEA, ASCII, Binary
Output Rate	0.1 to 200 Hz
Logging capacity	4 GB or 48h @ 200 Hz
Serial RS-232/422	Model N - 2 outputs / 4 inputs Model E - 3 outputs / 5 inputs
Serial Baud Rates	2,400 to 921,600 bps
Ethernet	5 inputs / 5 outputs (TCP/IP, UDP serial port) FTP for data logger access HTTP for configuration and monitoring
CAN	1 CAN 2.0 A/B bus up to 1 Mbit/s
Pulses	5 inputs (PPS, Event marker @ up to 1kHz) 2 outputs (SyncOut, Trigger)
Latency	<3 ms (motion to output)

## ENVIRONMENTAL SPECIFICATIONS

Operating Vibrations	8 g RMS - 20 Hz to 2 kHz as per MIL-STD-810G
IP Rating	IP68
Operating Temperature	-40° to 85°C / -40° to 185°F
MTBF	50,000 hours

## PRODUCT CODE INS

EKINOX-#-G#A#-PS

MODEL |  
N: INS with  
internal GPS  
E: INS

ACCELEROMETERS  
1: 2 g 3: 10 g  
2: 5 g 4: 30 g

GYROSCOPES  
4: 300 °/s 6: 800 °/s

## Seamless Integration



### DEVELOPMENT KIT

The Ekinox Development Kit consists of a GPS antenna, a power supply, an Ethernet cable, a quick start guide and the user manual. A set of software tools is included such as the sbgCenter application, API C libraries with code examples, etc.

### NEED A CUSTOM PACKAGE?

Every industry has its own constraints. Our Sales Engineers will work with you to recommend the right solution for your project, or for an entirely custom design.

### SBG SYSTEMS SERVICES

Support - Training - Custom Design