



Swedish tech company with a core competency in stabilizing technologies. Kebni develops advanced products and applications for stabilization, navigation and satcom, **bringing stability to a world in motion.**



Product area Inertial Sensing

Kebni develops Inertial Sensing products, tailored solutions and applications for advanced stabilization, navigation and motion analysis.



Off-the-shelf products

Standardized and customizable multi-sensor platforms for integration into autonomous systems and vehicles.



Tailored solutions

Fully customized and tailored Inertial Sensing solutions for specific customer needs.



Applications

End-to-end applications solving critical needs in various industries utilizing Kebni's sensor expertise.

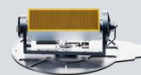
Product area Satcom

Kebni develops Satcom solutions for ships and land vehicles that, through a unique combination of Satcom and stabilization expertise, meet high demands for precision, stability, and performance, even in extreme conditions.



Maritime segment

Kebni's maritime antennas feature a 4-axis stabilization system, enabling stable satellite communication regardless of the ship's movement.



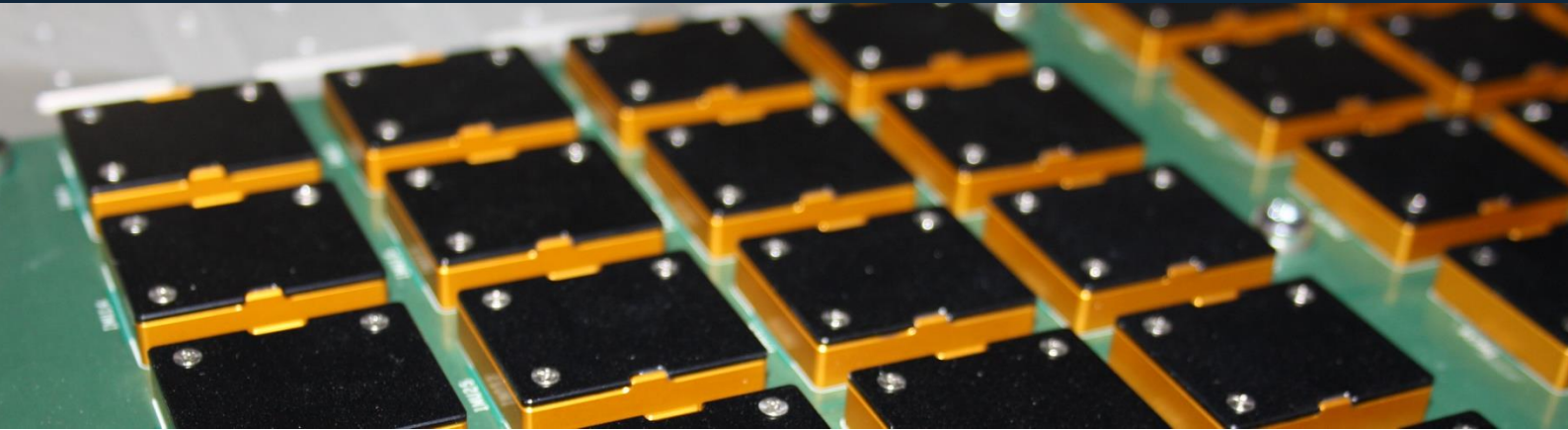
Land segment

Kebni's antennas for land vehicles are used in various fields including Search & Rescue and the defense industry.



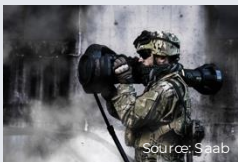
Kebni Inertial Sensing

Kebni develops advanced multi-sensor products and applications for stabilization, positioning and navigation



Kebni's Inertial Sensing solutions have a proven track record of performance and reliability. Renowned customers attest to their battle-proven durability in harsh environments, year after year.

Use case examples



Source: Saab

Rough environment

Developing key onboard sensors for e.g. Saab NLAW missile



Space navigation

Navigation support for e.g. Mars rover



Source: Epiroc

Autonomous vehicles

Navigation for e.g. Epiroc's autonomous underground loaders



Predictive analysis

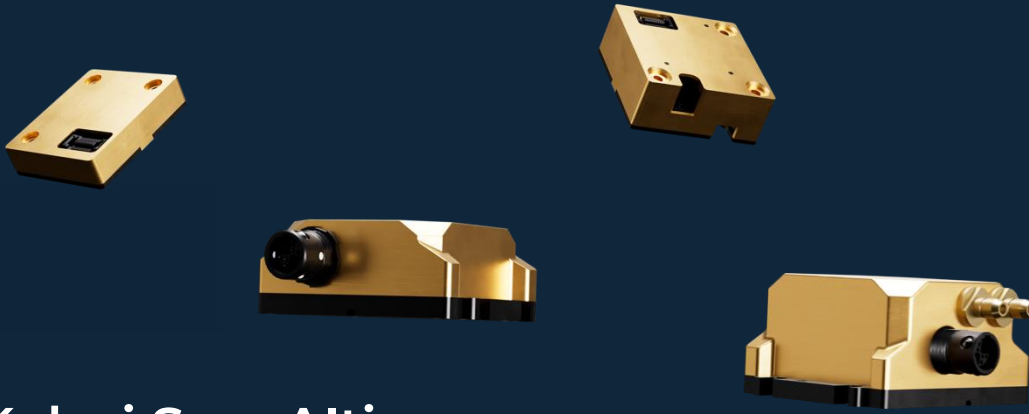
Maintenance prediction on e.g. BAE Systems' artillery system Archer

Technical advantage

Our highly skilled engineers develop and deliver tailored solutions for diverse client needs in various environments. Top performance and reliability is achieved through careful selection of high-spec sensors, advanced algorithms, modular hardware, and state-of-the-art calibration.

Supports your business

Kebni's slim organization ensures high flexibility, responsiveness and cost efficiency. Our scalable capacity enables offshore manufacturing to support end-user purchasing offset requirements as needed. Additionally, the products are ITAR-free with no export restrictions, to further ease for the client.



Kebni SensAltion

The most versatile IMU & INS platform

SensAltion is the ideal multisensor IMU/INS platform for robust performance in land, maritime and air applications

Leveraging heritage

Kebni has supported Formula 1 and Superbike racing teams win gold. With expertise in IMU (Inertial Measurement Unit) and INS (Inertial Navigation System), Kebni has developed navigation solutions for vehicles in diverse environments, from deep underground to Mars' surface. Leveraging this extensive experience, Kebni now introduces the state-of-the-art multisensor platform SensAltion.

Tailored for autonomy

SensAltion is uniquely positioned to meet tomorrow's demands of autonomous client platforms in terms of specifications, compatibility, cost, and regulatory compliance.

Unique flexibility

SensAltion is available as IP67 rugged version with complete environmental protection and internal power supply filtering, and an OEM version for seamless integration into customer solutions. The platform is AI-ready and supports in-depth customization. Optional features include heave motion analysis and other additional functionalities.

Full INS capability

SensAltion's modular hardware design supports optional inclusion of additional sensors and computations. The INS version offers full navigation capability including dual internal GNSS receivers. The advanced sensor fusion technology supports supplementary sensors, e.g. odometer, to ensure top performance in all conditions.

Scalable production

SensAltion, being ITAR-free and without export restrictions, is produced in a scalable production site, and can also be produced overseas as a client service.

SensAltion Control Center

With Kebni's software tool it's easy to configure and test the units. The control center is a graphical user interface that includes functions for sensor & protocol configuration, magnetometer hard & soft iron calibration, data visualization and logging.

TOP PERFORMANCE & RELIABILITY

- ✓ High-spec sensors
- ✓ Advanced sensor fusion algorithms
- ✓ Modern module-based software design
- ✓ Modular hardware design
- ✓ Advanced calibration process
- ✓ Extensive testing
- ✓ Easy-to-use configuration tool



Kebni SensAltion

IMU and AHRS versions

The Kebni SensAltion platform offers a compact and high-performance Inertial Measurement Unit (IMU) and Attitude and Heading Reference System (AHRS). The 9 degrees-of-freedom (DoF) multisensor unit combines several sensor types. Each unit undergoes individual calibration using advanced real-time compensation algorithms and processes to mitigate sensor errors across the full temperature range.

The product is available in IMU or AHRS functionality. The IMU version provides fully compensated sensor data at a high data rate.

The AHRS version, equipped with Kebni's advanced onboard sensor fusion software and Kalman filter, offers attitude

including heading data. The AHRS can also be used as a Vertical Reference Unit (VRU) to measure attitude (roll/pitch) in dynamic conditions. The onboard Kalman filter continuously estimates and compensates for sensor bias and scale factor errors in real time.

The sensor fusion software includes functionality for hard/soft iron calibration for the magnetometer after installation and a real-time algorithm for magnetic disturbance rejection.

The product is available in a rugged version for complete environmental protection, including internal power supply filtering, or as an OEM version for tight integration.

Technical specifications

General specifications

| | |
|-------------------------------|--|
| Internal Sensors | Accelerometer, Gyro, Magnetometer, Pressure and Temperature Sensor |
| Ambient Operating Temperature | -40°C to +70°C |
| Ambient Storage Temperature | -40°C to +85°C |
| Vibration | 8 grms MIL-STD 810G 20-2000 Hz |
| Shock | 100 g, 6 ms and 1500 g, 0.5 ms MIL-STD 810G |

Inertial sensor specifications

| | Accelerometer | Gyro |
|---------------------------------------|------------------|--------------------|
| Range | 2/4/8/16 g | 250/490 °/s |
| Bandwidth ⁽⁴⁾ | 218 Hz | 250 Hz |
| In-run Bias Stability ⁽¹⁾ | ≤30 µg | ≤2 °/h |
| Bias Error ⁽²⁾ | 2 mg 1σ | 0.06 °/s 1σ |
| Scale Factor Error ⁽²⁾ | 0.075 % 1σ | 0.1 % 1σ |
| Non-linearity | - | 0.02% |
| Noise Density ⁽³⁾ | 0.05 mg/√Hz typ. | 0.003 °/s/√Hz typ. |
| Random Walk | 0.03 m/s/√h typ. | 0.1 °/√h typ. |
| Cross-Axis Sensitivity ⁽³⁾ | 0.05° | 0.05° |

⁽¹⁾ Allan deviation curve, constant temperature, typical value

⁽²⁾ Max value over full temperature range

⁽³⁾ Max value at +25°C

⁽⁴⁾ Custom filtering is available on request

AHRS specifications

| | |
|-----------------------------------|-------------------|
| Roll/Pitch (Static) | 0.2° RMS |
| Roll/Pitch (Dynamic) | 1.0° RMS |
| Heading (Magnetic) ⁽⁵⁾ | 1.5° RMS, dynamic |

⁽⁵⁾ Tested in real outdoor conditions and with valid hard/soft iron calibration

Interface specifications

| | |
|--------------------------------|---|
| Connector (Rugged) | 12-pin miniature circular push-pull |
| Data (Rugged) | CAN 2.0 A/B, RS-232 |
| Electrical (Rugged) | 12/24 VDC typ. (9 - 32 VDC) Internal filtering complies with ISO 7637-2 and ISO 16750-2 load dump with suppression |
| Power Consumption (Rugged/OEM) | 0.8 W typ. |
| Connector (OEM) | 20-pin micro board mounted |
| Data (OEM) | CAN 2.0 A/B, UART TTL, SPI, I2C |
| Electrical (OEM) | 3.3 - 5.5 VDC |
| Data Rate | Up to 1 kHz |
| Serial Protocol | Binary and NMEA |
| Sync | Sync-in and Sync-out |

Magnetometer specifications

| | |
|---------------|---------------------|
| Range | 8 Gauss |
| Bandwidth | 40 Hz |
| Noise Density | 0.6 mGauss/√Hz typ. |

Pressure Sensor specifications

| | |
|------------|-----------------------------|
| Range | 260 - 1260 hPa |
| Resolution | 0.025 Pa |
| Accuracy | 10/100 Pa Relative/Absolute |

Mechanical specifications

| | |
|---------------------|-----------------------------------|
| Housing (Rugged) | Aluminium, sealed IP67 |
| Dimensions (Rugged) | 40 x 33 x 16 mm (excl. connector) |
| Weight (Rugged) | 33 grams |
| Dimensions (OEM) | 29 x 24 x 7 mm |
| Weight (OEM) | 7 grams |



Kebni SensAltion

INS version

The Kebni SensAltion Inertial Navigation System (INS) is a miniature, high-performance multi-sensor navigation system. It includes inertial sensors, dual high-precision GNSS receivers, 3-axis magnetometer, and barometric pressure sensor. Each unit is individually calibrated for sensor errors across the full temperature range using real-time compensation algorithms and calibration processes.

The INS provides robust position, velocity, attitude, and heading data through Kebni's advanced onboard sensor fusion software and Kalman filter. Its dual GNSS receiver configuration ensures accurate heading data in both static and dynamic conditions, eliminating magnetic disturbance issues.

The unit supports external odometer aiding for improved performance in land vehicle applications and RTK aiding for centimeter-level accuracy. The onboard Kalman filter estimates and compensates for sensor bias and scale factor errors in real time.

The sensor fusion software includes functionality for hard/soft iron calibration for the magnetometer after installation and a real-time algorithm for magnetic disturbance rejection.

The product is available in a rugged version for complete environmental protection, including internal power supply filtering, or as an OEM version for tight integration. The INS is also available without internal GNSS receiver with support for using an external receiver.

Technical specification

General specifications

| | |
|-------------------------------|--|
| Internal Sensors | Accelerometer, Gyro, Dual GNSS Receiver, Magnetometer, Pressure and Temperature Sensor |
| External Aiding Sensors | Odometer, RTK and external GNSS |
| Ambient Operating Temperature | -40°C to +70°C |
| Ambient Storage Temperature | -40°C to +85°C |
| Vibration | 8 grms MIL-STD 810G 20-2000 Hz |
| Shock | 100 g, 6 ms and 1500 g, 0.5 ms MIL-STD 810G |

Inertial sensor specifications

| | Accelerometer | Gyro |
|---------------------------------------|------------------|--------------------|
| Range | 2/4/8/16 g | 250/490 °/s |
| Bandwidth | 218 Hz | 250 Hz |
| In-run Bias Stability ⁽¹⁾ | ≤30 µg | ≤2 °/h |
| Bias Error ⁽²⁾ | 2 mg 1σ | 0.06 °/s 1σ |
| Scale Factor Error ⁽²⁾ | 0.075 % 1σ | 0.1 % 1σ |
| Non-linearity | - | 0.02% |
| Noise Density ⁽³⁾ | 0.05 mg/√Hz typ. | 0.003 °/s/√Hz typ. |
| Random Walk | 0.03 m/s/√h typ. | 0.1 °/√h typ. |
| Cross-Axis Sensitivity ⁽³⁾ | 0.05° | 0.05° |

⁽¹⁾ Allan deviation curve, constant temperature, typical value ⁽²⁾ Max value over full temperature range ⁽³⁾ Max value at +25°C

INS specifications⁽⁶⁾

| | |
|----------------------|---|
| Roll/Pitch (Dynamic) | 0.05° RMS |
| Heading (1xGNSS) | 0.3° RMS, dynamic |
| Heading (2xGNSS) | 0.2° RMS with 2 m baseline, static and dynamic |
| Velocity | 0.05 m/s (with SBAS) 0.03 m/s (with RTK) |
| Position Horizontal | 0.9 m CEP (with SBAS) 0.01 m CEP + 1 ppm ⁽⁷⁾ (with RTK) |
| Position Vertical | 1.1 m Median (with SBAS) 0.01 m Median + 1 ppm ⁽⁷⁾ (with RTK) |

⁽⁶⁾ Under good GNSS availability ⁽⁷⁾ ppm error of distance to base station

Interface specifications

| | |
|--------------------------------|--|
| Connector (Rugged) | 12-pin miniature circular push-pull and dual SMB GNSS antenna ports |
| Data (Rugged) | CAN 2.0 A/B, RS-232 12/24 VDC typ. (9 - 32 VDC) Internal filtering complies with ISO 7637-2 and ISO 16750-2 load dump with suppression |
| Electrical (Rugged) | 1.5W typ. (with dual GNSS antennas) |
| Power Consumption (Rugged/OEM) | 20-pin micro board mounted |
| Connector (OEM) | CAN 2.0 A/B, UART TTL, SPI, I2C |
| Data (OEM) | 3.3 - 5.5 VDC |
| Electrical (OEM) | Up to 1 kHz |
| Data Rate | Binary and NMEA |
| Serial Protocol | Sync-in and Sync-out |
| Sync | |

Magnetometer specifications

| | |
|---------------|---------------------|
| Range | 8 Gauss |
| Bandwidth | 40 Hz |
| Noise Density | 0.6 mGauss/√Hz typ. |

Pressure Sensor specifications

| | |
|------------|-----------------------------|
| Range | 260 - 1260 hPa |
| Resolution | 0.025 Pa |
| Accuracy | 10/100 Pa Relative/Absolute |

Mechanical specifications

| | |
|---------------------|-----------------------------------|
| Housing (Rugged) | Aluminium, sealed IP67 |
| Dimensions (Rugged) | 45 x 38 x 23 mm (excl. connector) |
| Weight (Rugged) | 53 grams |
| Dimensions (OEM) | 33 x 32 x 13 mm |
| Weight (OEM) | 21 grams |

GNSS receiver specifications

| | |
|---------------|---|
| Receiver Type | 184 channel, GPS: L1C/A, L2C, GLONASS: L1OF, L2OF, Galileo: E1B/C, E5b, SBAS: L1C/A, BeiDou ⁽⁸⁾ : B1I, B2I, QZSS ⁽⁸⁾ : L1C/A, L2C |
| Update Rate | 10 Hz |
| Cold Start | <25 s |

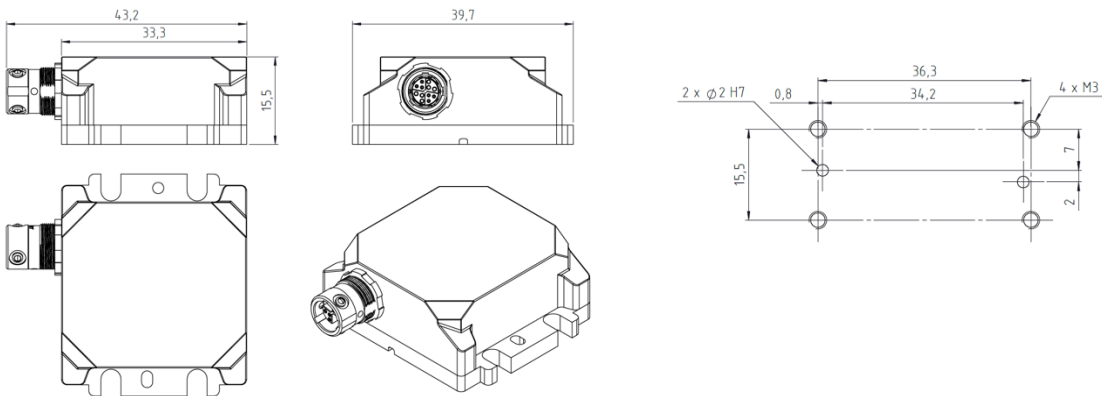
⁽⁸⁾ Available on request



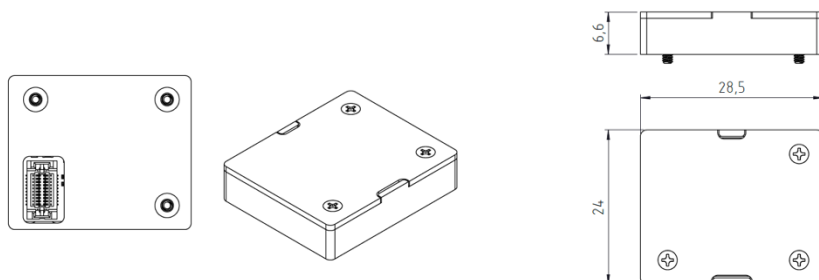
Kebni SensAltion

Drawings

IMU/AHRS Rugged



IMU/AHRS OEM

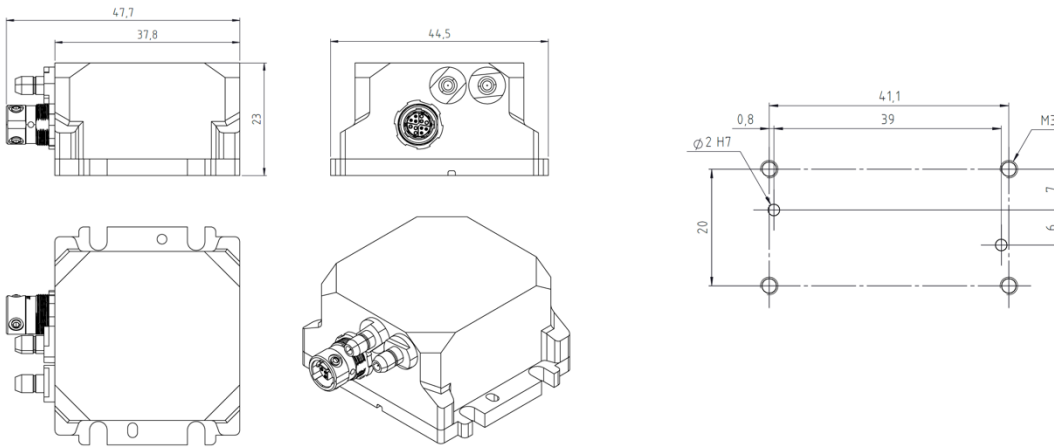




Kebni SensAltion

Drawings

INS Rugged



INS OEM

