Datasheet
Black Oak Engineering

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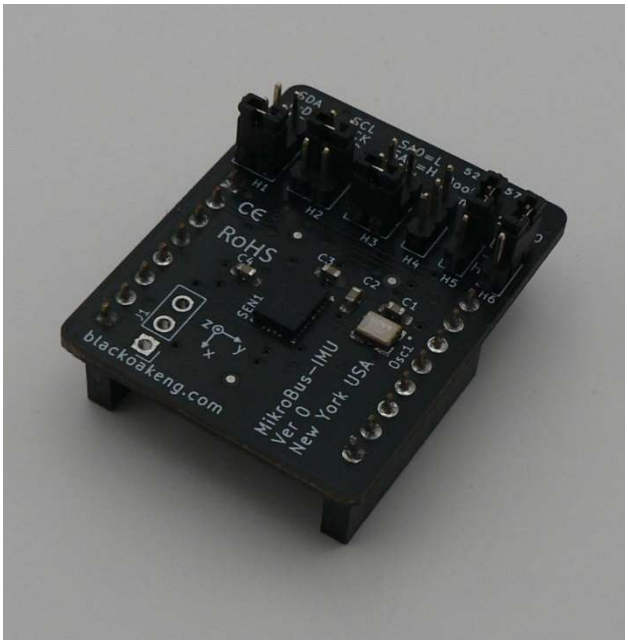
IMU1 Module with MikroBus Interface

Version 0

Part number `BE-KIM1`



Description. The Black Oak Engineering IMU1 Module with MikroBus interface (#BE-KIM1) provides an accurate 3-axis accelerometer, 3-axis rotation gyrometer, and a 3-axis magnetometer, on a simple, standardized PCBA module. Either IIC, SPI, UART, or UART-RVC may be used to communicate with it. The IMU1 incorporates technology from Black Oak Engineering, Bosch Sensortec, Ceva DSP, and Hillcrest Labs. A highly stable 32768 Hz oscillator clock source is included. The Bosch / Ceva BNO085 is primarily intended for use in mobile devices. However, it is far simpler to develop with and use on the MikroBus platform. The SensorNet API is well documented and available freely from Ceva. As always, BOE is available for value-added support.

It has a wide operating temperature range of -40 to +85 °C (-40 to +185 °F).

MikroBus is a common, convenient interface form factor. The IMU1 requires only the RST, 3V3, Gnd, and communication signal lines. There are two rows of eight sockets, 100-mil (2.54 mm) separation, 900 mil (22.86 mm) row to row. Board is 1.1 x 1.3 inch (28 x 33 mm).

Basic IMU1 specifications

- MikroBus form factor.
- Supports determination of linear acceleration, angular velocity, quaternion angular position.
- Calibration supported for both static and dynamic modes. Performance specifications given for calibrated device.
- Accelerometer: 3-axis, 12 bit precision, ±8 g range.
- Linear acceleration: 0.35 m/s^2.
- Gravity vector: Error < 1.5 °.
- Gyrometer: 3-axis, 16 bit precision, ±2000 °/sec range.
- Rotation vector: Error < 3.5 ° dynamic, < 2.0 ° static.
    - Latency 6.6 ms @ 100 Hz, 3.7 ms @ 200 Hz.
- Geomagnetic rotation vector: Error < 4.5 ° dynamic, < 3.0 ° static.
- Gyroscope accuracy: 3.1 °/sec.
- Magnetometer accuracy: 1.4 µT.
- Current load varies greatly depending on operating mode. Typical minimum is 220 µA, and the maximum is 14 mA under full sensor fusion.
- Temperature operating range: -40 to +85 °C (-40 to +185 °F).
- Humidity / water exposure. The PCBA does not include a protective enclosure. Nor is it conformally coated. Condensing humidity and water exposure must be completely avoided.
- The nearby presence of metallic structures may affect the magnetometer.

BOE is continuously improving. We also strive to keep one step ahead of procurement shortfalls. We will deliver to you the latest hardware version possible. In some cases specifications will change.

Additional Approvals & Compliance

- RoHS.
- REACH.
- California Prop 65.

Value Added Design. Want to use the IMU1 module in a new project or OEM application, but need a little assistance? Not a problem. BOE contracts regularly with end users for value added design.

Warranty Policy. Any instrument ordered from BOE may be returned for full refund, less shipping costs, within 30 days of delivery, provided that the instrument has not, in the opinion of BOE been damaged or misused. An RMA number is required in all cases. See our *Standard Terms & Conditions – Instruments* for more details.

BOE reserves the right to make changes to these specifications as it deems necessary. All technical information contained herein is as accurate as possible; however BOE shall not be held responsible for any errors or for product use, nor for any infringements upon the rights of others which may result from its use. BOE products are not to be used in life support or safety critical applications.

All BOE products are designed and manufactured in the USA.