

Datasheet

Black Oak Engineering precision electronic instruments

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Monarch-Mag3 ± 8 Gauss (0.8mT) Magnetic 3-Axis Sensor



Part number BE-MMG3
Version 1.0



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Description. The Monarch-Mag3 is a simple, rugged, compact magnetic sensor that measures up to ± 8 Gauss (± 0.8 mT). It is small enough to fit into tight spaces. For reference, the geomagnetic field varies considerably due to local geology and interferences, but is typically $\approx 30 \mu\text{T}$ (0.3 Gauss). The Monarch-Mag3 connects via a USB-C cable (included). This provides power and communications. It uses Anisotropic Magnetoresistive (AMR) elements. These are not the most accurate sensors available, but they may be fabricated via photolithography. Properly used, they make a reliable, rugged magnetometer.

Basic specifications

- Range: -8 to $+8$ Gauss (-0.8 mT to $+0.8$ mT) in 3 axes.
- Axes indicated on enclosure.
- Precision: 3.8 ppm.
- Accuracy: $\pm 0.5^\circ$. Contact BOE for nulling procedure.
- Bandwidth: DC to 1 kHz.
- Programmable degaussing.
- Integrated temperature sensor.
- Shielded low-noise construction.
- Current: 10 mA normal operation.
- Standard 1 m USB-C cable.
- Communication is serial stream via USB. For greater programmability you may use the Acorn API. This is an easy and extensible data layer.
- Temperature range: -40 to $+80^\circ\text{C}$ (-40 to $+175^\circ\text{F}$).
- Compact size: 35 L \times 35 W \times 15 H mm. (1.4 L \times 1.4 W \times 0.6 H inch), with mounting flanges.
- EAN-13 0729043992614



Monarch butterfly (*Danaus plexippus*) They migrate annually from Mexico and the southern US to the northern areas, often 1800 miles (2900 km) away. They lay their eggs in milkweed plants, which the larvae require. Their navigational skill depends primarily upon solar tracking and an accurate clock, but there is strong evidence that the monarch can also sense Earth's magnetic field.

BOE is here to support you. If you need a modification, contact us. Our Engineering team can often make adjustments to the standard design.

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.

Approvals & Compliance

- RoHS. REACH.
- California Prop 65. There are no listed toxic materials in the PCBA.
- CE. The system is designed and tested to meet or exceed CE requirements for laboratory, non-safety-critical electronic devices.

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.

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Rev Dec 21