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

1. Connect the Monarch via USB cable to the host computer. The Monarch uses a USB-C connector, but the other end can be USB-A (most common) or any form that is convenient. The host computer needs only a USB 2.0 host connector. It can be a PC, an Apple, a Linux, or other platform. It can be a desktop, a laptop, a tablet, a mobile device. You may use a hub. The USB device should enumerate (connect) automatically. The Monarch uses a trusted USB driver. (Make sure your USB cable is a complete data + power one, not a power-only one.)

2. The Monarch will connect to a free COM port. Verify that its LED is flashing slowly.

3. The default serial setting is 115,200 baud, 8N1, no handshaking. The default is to output strings in the example format below. Output is at 1.8 Hz (18 strings every 10 sec). The magnetic measurement is in Gauss. 1 Gauss = 100 µT. These data are raw, not filtered or averaged in any way. Note, the Earth's magnetic field varies widely and is not isotropic. Much of what the Monarch sees around it is immersed in this widely-varying and dynamic field.

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X=0.079G, Y = -0.229G, Z=-0.452G, T=20.2C
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4. You can communicate with the Monarch in the following ways:

    a) Through a terminal emulator program such as PuTTY or TeraTerm (both free). This alone may be sufficient for your needs.

    b) Through a terminal program, using Acorn commands. Acorn is a simple, efficient API for communicating with instruments. It is documented on the Black Oak Engineering website.

    c) The Monarch is often used in embedded systems. It simply needs a USB CDC port. Again, use the Acorn API to talk with it.

    d) Through Black Oak Engineering's *BOE-scope* Windows graphing program.

5. Avoid strong magnetic fields. 10 G should be the limit. A rare earth magnet placed a few cm from the Monarch can easily exceed this limit.

6. The Monarch is set by default to degauss itself after every measurement cycle. Even so, you may find that there is a fixed offset. Contact BOE for the procedure to counteract this for greater accuracy.

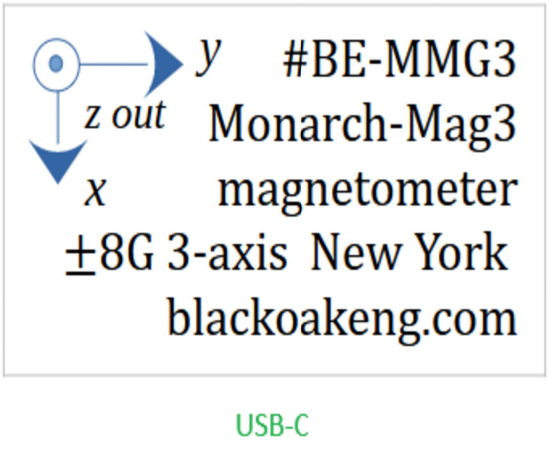

Figure 1: Monarch axes. This is the label affixed to the bottom of unit.