Datasheet

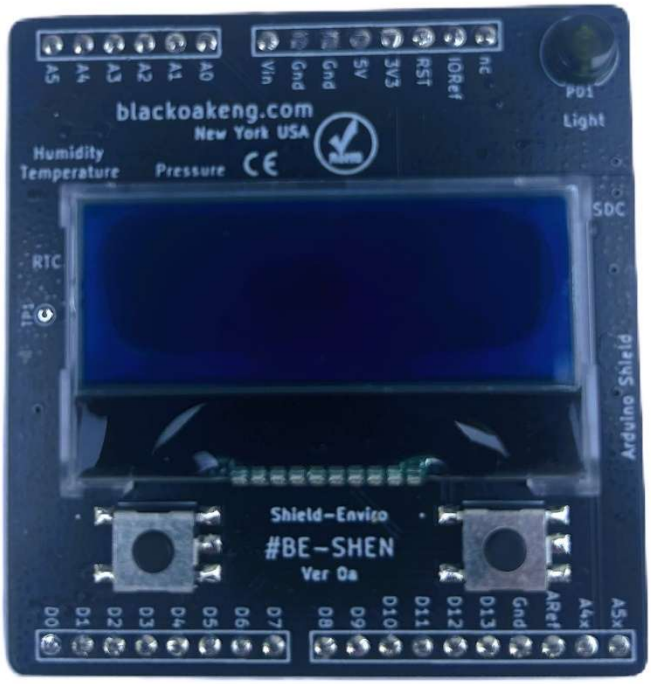
Black Oak Engineering

precision electronic instruments

New York · USA · blackoakeng.com · (347) 467-0912

Environmental Monitor Shield

Part number BE-SHEN
Version 1.0



Description. The Black Oak Engineering (BOE) Environmental Monitor (#BE-SHEN) has a standard Arduino Uno R3 Shield pinout. The board is smaller than an Arduino Uno. It will work with any host that supports the standard interface. It provides sensors for temperature, humidity, barometric pressure, and light level. It has a 16x2 transmissive SPI LCD with backlight that can be programmed to display measurements and status. It has two assignable tactile switches for user input. It has a Real Time Clock for accurate, uninterrupted time keeping. It also has a micro SD card holder for recording data. It operates at low power and is suitable for battery operated hosts. Sensors (except photo sensor) and SD card are on bottom to minimize the effect of dust.

A complete set of tested drivers is available at our GitHub. BOE releases source code and other collateral under an attached MIT license.

Basic SimpleDaq specifications

- Temperature
  - Range −40 to 85 °C (−40 to 185 °F).
  - Accuracy ±0.2 °C between 0 and 65 °C. Error increases linearly at extrema.
  - IIC interface.

- Relative Humidity
  - Range 0 to 100 %.
  - Accuracy ±1.8 %.
  - Response time 4 sec.
  - IIC interface.
- Barometric pressure
  - Range 4.4 to 18.1 psi (30 to 125 kPa).
  - Accuracy ±9 Pa.
  - SPI interface.
- Photometer
  - Dual range for extended sensitivity.
  - Illuminance range 200 to 100,000 lux.
  - Analog pins to host used.
  - Collimating baffle included.
- Real Time Clock
  - Records hours, minutes, seconds, centiseconds, day of week, date, month, year.
  - Adjusts for leap year.
  - Calibratable to ±1 ppm.
  - Programmable alarm.
  - Uses Vsource as battery backup.

    - SPI interface.
- Low power design.
- Any reasonable combination of 100-mil headers or sockets may be used to connect to host.

Power

- The Environmental Monitor Shield uses the standard Arduino Uno +5V and +3.3V power pins.

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

Environmental

- Temperature. -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.

Approvals & Compliance

- RoHS.
- REACH.
- California Prop 65.

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.

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