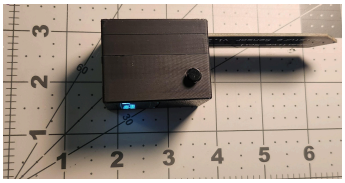
Soil Monitor

Overview

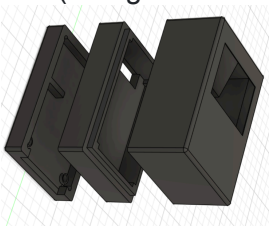
The Soil Monitor is a battery-powered, OLED-based moisture sensor that shows real-time soil moisture and battery level, and tells plant lovers when to water. Measures 119 × 37 × 34 mm (52 g). Features a 3D-printed enclosure (Fusion 360) and calibration-tuned firmware optimized for succulents.

Photos

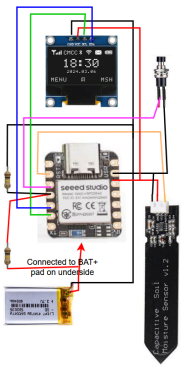
Top / Side Views



Enclosure (Designed in Fusion 360)



Wiring



Component	XIAO nRF52840 Pin
OLED (SSD1306, I2C)	SDA → GPIO 4 SCL → GPIO 5
Moisture Sensor	A1 (Pin 1)
Battery Voltage Divider	A3 (Pin 3) via 100kΩ–100kΩ
Wake Button	GPIO 2 → GND
Battery	BAT+ pad + GND pin

Code

- Open Arduino IDE, select 'XIAO nRF52840 (No Updates)'
- Connect the Seeed Studio XIAO nRF52840 board to your machine
- Upload SoilMon.ino file in the project files here

Lessons Learned

- Define power & size constraints before wiring & coding
- Power/ground rails simplify small builds
- Small enclosures need tighter tolerance testing
- Moisture thresholds are plant & environment specific
- Soldering on tiny boards increases short-circuit risk

Full build log, code, and files: https://github.com/ChandlerEx/Projects