

Soil-SENSE

Biofiltration (bioswale) monitoring system

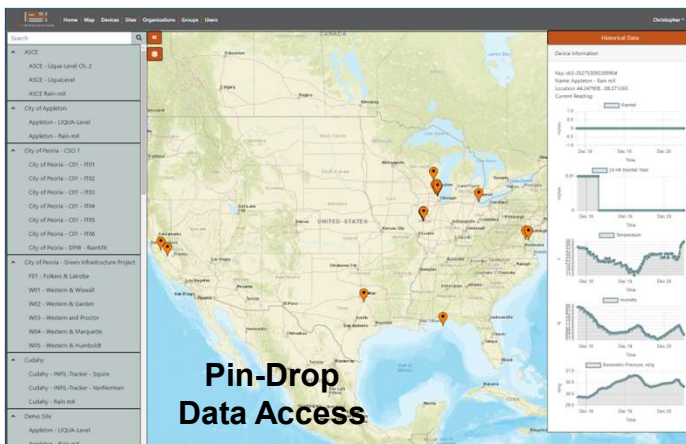


Soil-SENSE is a robust soil moisture content, electrical conductivity, and temperature measurement system for biofiltration stormwater infrastructure.

Coupling Soil-SENSE with P4's Rain-mX and Flow-RTC creates a stormwater infrastructure monitoring and performance documentation system.

Battery health and (solar) re-charging cycles are documented and displayed.

Wireless data transmission.



Applications & Value

Biofiltration systems

Performance documentation

Data-driven maintenance

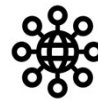
Data Sampling & Resolution

10-min (standard)

3.0% accuracy (VMC)

1 L volume of influence

1 mS/cm (bulk EC)



Nationwide cellular connectivity (LoRa and WiFi possible)



Soil measurements:

- Volumetric moisture content (VMC)
- Electrical conductivity (EC)
- Soil temperature
- Gradient over biofilter height



Browser-based dashboard (viewing and data download). Advanced notice of potential problems. Data visualization. Data-driven maintenance notification.



Water-level monitoring system to complement other sensor systems (synchronized data)

Soil-SENSE – Specifications

Communication

- Cat-M1 cellular (2G, 3G, 4G LTE compatible)
- Wi-Fi option
- Long Range WAN (LoRa) option

Power

- Voltage – 12V DC
- Battery – 5,000 mAh NiMH pack (modular)
- No external power required
- Remote battery health
- Solar re-charging with remote monitoring

Operating Temperatures & Compliance

- Fahrenheit: -30 °F to 120 °F
- Celsius: -34 °C to 49 °C
- FCC and RoHS

Installation & Measurement

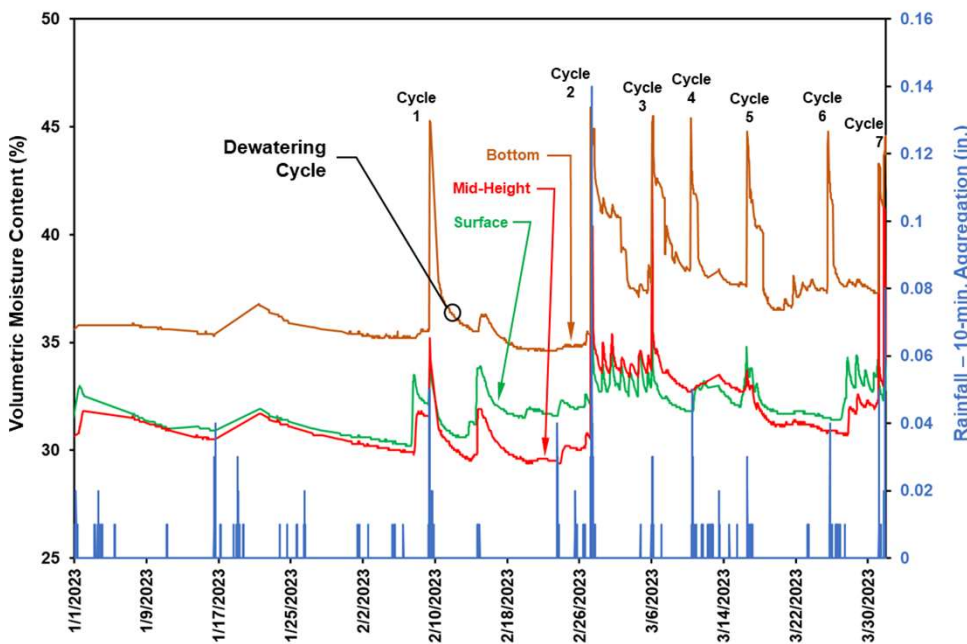
- Post-construction installation
- Easy removal and replacement of sensor
- Gradient measurements over height

Maintenance

- Modular system (sensors, computer, battery)
- Remote battery health monitoring
- Solar panel cleaning (every 6 months – location dependent)

User Interface & Standards

- Cloud via internet browser
- CSV downloading
- Mobile via iOS and Android
- 90% data reliability



How do you know your biofiltration system is working?

How do you how many wetting cycles your biofilter sees each year?

How do you how long it takes for your biofilter to dewater after a rain event?

Soil-SENSE