

## Waterproof $\text{CO}_2$ Sensor for Continuous In-Situ Monitoring

- ACCURATE
- DURABLE
- COMPATIBLE
- WATERPROOF
- COMPACT

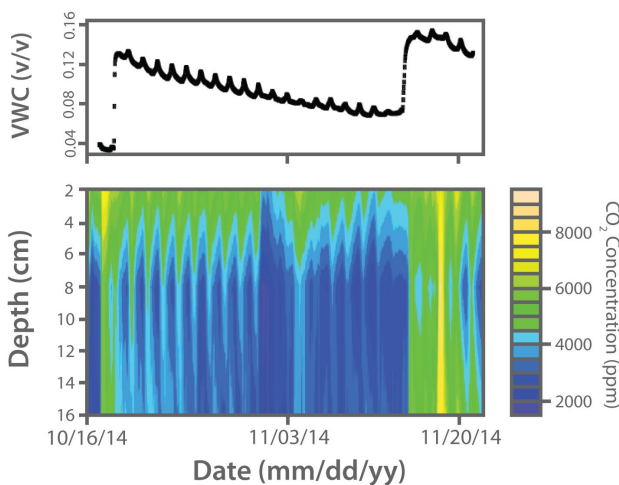


The eosGP gas probe offers continuous in-situ monitoring of  $\text{CO}_2$  concentrations. Its robust design is ideal for harsh deployments—buried in soil, submerged in a stream or lake, or covered in snow.

Low power requirements, out-of-the-box submersibility, small size, and compatibility with standard dataloggers make the eosGP an easy addition to your field kit.

### CONTINUOUS IN-SITU MONITORING

This is a hard working device—its continuous data stream lets you capture patterns, trends and variability in the field.



*Data from GP sensors buried in alfalfa fields at 2, 8, and 16 cm depths showing diurnal and weather related variation in  $\text{CO}_2$  concentrations.*

### HARSH ENVIRONMENTS

The eosGP's broad operating temperature range (-20 C to 50 C / -4 F to 122 F) and built-in temperature correction means you can use this probe in most climates. Its strong, waterproof housing with optional anti-fouling copper mesh allows long-term fresh water deployment to depths of 3 m / 10 ft.

### COMPACT & LOW ENERGY

Small and light—fitting easily into your hand—this device can go anywhere. Its peak power consumption of less than 1 W can easily be handled by, for example, a modest solar panel. The device produces very little heat, so it has minimal thermal effect on its environment.

### INTEGRATION & COMPATIBILITY

The eosGP likely connects conveniently with your current field infrastructure. Its standard 0 V to 5 V analog outputs are compatible with most dataloggers, and it can be powered by commonly available 5 V DC to 24 V DC sources, just like your other equipment.

## eosGP IN WATER

The monitoring of fresh water CO<sub>2</sub> concentrations is critical for applications ranging from carbon balance research to public safety. The eosGP is sealed and ready for action in fresh water to depths of 3 m / 10 ft. Equilibration time is kept short by minimizing the interior volume of the eosGP and maximizing the CO<sub>2</sub> transfer rate across the hydrophobic membrane.

## EXAMPLE

Several eosGPs were attached to a submersible stringer chain along with O<sub>2</sub> and environmental sensors to study the relationships between gas production and consumption in the water column.



*eosGPs connected to Campbell Scientific datalogger*

## eosGP IN SOIL

Soil CO<sub>2</sub> concentrations are highly variable and can sometimes span many orders of magnitude in a short time. This high variability can result in missed measurements when the calibration range of a sensor is exceeded. Eosense's optional dual-range calibration allows for measurement of large variations in soil CO<sub>2</sub> concentration while also maximizing sensor accuracy. Additionally, the combination of a strong acetal housing and water-tight sealing makes eosGP sensors the ideal choice for in-situ soil CO<sub>2</sub> monitoring.

## EXAMPLE

eosGP sensors were buried at 2, 8 and 16 cm depths in an alfalfa field. On the chart overleaf you can see the strong diurnal changes in CO<sub>2</sub> concentration, driven by temperature changes in the upper soil layers, as well as the synoptic variation due to rainfall events shown in the upper plot.



*eosGPs in alfalfa field*

## ACKNOWLEDGEMENT

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## SPECIFICATION HIGHLIGHTS

Dimensions (Ø x L)	5.1 x 10.7 cm / 2 x 4.2 in
Operating temperature	-20 to 50 C / -4 to 122 F
Operating power - avg / peak	< 0.5 / < 1 W
Operating voltage	5 to 24 V DC
Time to equilibrium	< 90 s (in air)
Mass (approx)	200 g / 0.44 lb
Output voltage	0 to 5 V DC
Concentration accuracy	1% range + 1% reading
Calibration ranges (ppm)	0-5,000, 0-20,000, custom

## CONTACT

**888.352.8313**

**info@eosense.com**