LI-COR



CARBON NODE

SCALABLE MONITORING. UNPRECEDENTED SIMPLICITY.

FAST, ACCURATE ANSWERS TO YOUR CARBON QUESTIONS

Questions about carbon flux in an ecosystem have always come easier than the answers. The new Carbon Node from LI-COR is here to change that. This all-in-one, next-gen Eddy Covariance (EC) carbon monitoring solution provides researchers with direct, actionable measurements that you can be confident in. As a trusted leader in EC systems, LI-COR has created a method of EC measurement that's easy, fast, and scalable.

Can fertilization and irrigation both improve yield and sequester more carbon at the same time?

How much carbon is your wetland sequestering?

Are government or corporate sustainability initiatives having the intended effect of lowering carbon emissions at the local level?



LI-COR | CARBON NODE

EASY SOURCING AND SETUP

When you purchase the Carbon Node, everything you need to collect and analyze data arrives in just three boxes. And each unit can be set up by a single person in as little as 30 minutes. The new user interface even makes maintenance simple. The Carbon Node has built-in diagnostics, and no special training is required.

FAST ACCESS TO ACTIONABLE DATA

Activate your Carbon Node, connect to the cloud, and you'll begin receiving actionable data within minutes. With LI-COR automatic data processing and QAQC, no manual analysis is necessary, saving you valuable time.

SCALABLE OPERATIONS

The Carbon Node opens up new opportunities for scalability that can increase the accuracy of your research. With a lower cost than traditional EC systems and requiring significantly less investment in setup, data processing, and maintenance, you can place and manage multiple Carbon Nodes across an ecosystem. You can also use it in conjunction with traditional EC instruments to create a precise, distributed EC site.

LI-COR CLOUD

Unmatched, Easy-to-Use Software



Through LI-COR Cloud, you'll have real-time access to Carbon Node data from anywhere. Your first year of LI-COR Cloud access is included with your Carbon Node and starts at just $650/year after that.

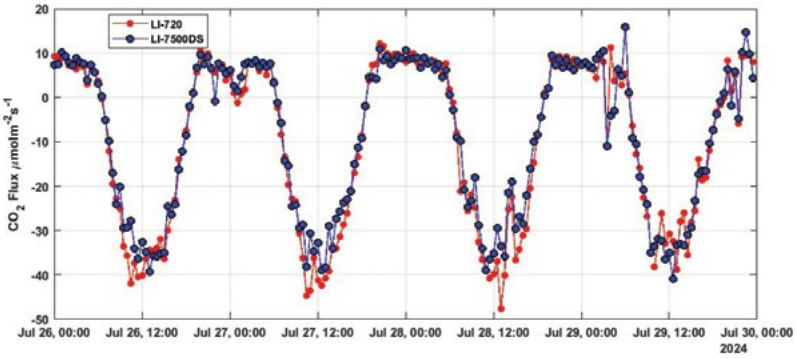
EXPLORE THE CARBON NODE

Learn about the Carbon Node's applications, functionality, and request a quote at **licor.com/products/carbon-node**.

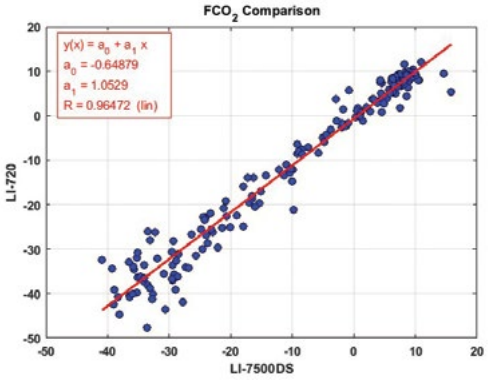
CARBON NODE

Actionable, Defensible Data

The LI-720 Carbon Flux Sensor applies the EC method to measurements of carbon dioxide concentration at 10 Hz, providing fully processed results every 30 minutes. When compared with traditional EC, the Carbon Node reports carbon dioxide flux with similar accuracy, but with a more streamlined solution.



Timeseries plot of an LI-720 Carbon Flux Sensor (red) and reference Eddy Covariance (blue) CO_2 Flux in July, 2024 over a rain-fed soybean field in Nebraska, USA. Diurnal trend shows uptake of carbon that is measured by the LI-720 and reference system.



30-minute carbon fluxes measured by an LI-720 Carbon Flux Sensor compared against a reference Eddy Covariance (LI-7500DS) system.

Specifications

CO_2 MEASUREMENT

Calibration Range: 0 to 1500 µmol mol^{-1}

Accuracy: Within 1.5% of reading

Zero Drift (per °C):
- ±0.15 ppm
- ±0.3 ppm maximum

RMS Noise (@ 400 µmol mol^{-1} CO_2):
@10 Hz: 1.0 ppm

Direct Sensitivity to H_2O (mol CO_2 mol^{-1} H_2O):
- ±2.00E-05
- ±4.00E-05 maximum

H_2O MEASUREMENT

Calibration Range:
- 0 to 60 mmol mol^{-1}

Accuracy: Within 1.5% of reading

Zero Drift (per °C):
- ±0.03 mmol mol^{-1}
- ±0.05 mmol mol^{-1} maximum

RMS Noise (@ 10 mmol mol^{-1} H_2O):
@10 Hz: 0.05 mmol mol^{-1}

Direct Sensitivity to CO_2 (mol H_2O/mol CO_2):
- ±0.02
- ±0.05 maximum

WIND MEASUREMENT

Wind Speed Measurement Axes:
U, V, W

Measurement Range:
0 – 30 m s^{-1} (horizontal wind conditions)

Offset at Zero Wind (W axis):
±0.06 m s^{-1}

RMS Noise (W axis):
<0.1 m s^{-1} @ 5 m s^{-1}, <0.15 m s^{-1} @ 15 m s^{-1}

Sonic Temperature Accuracy:
± 0.7°C maximum offset at 20°C

BIOMET MEASUREMENT

Photosynthetic Photon Flux Density:
- Range: 0-3000 µmol m^{-2} s^{-1}
- Accuracy: ±5% of reading
- Cosine Correction: Corrected up to 75° angle of incidence.

Biomet Air Temperature:
- Range: -40 – 60°C
- Accuracy: ±1.5°C – no load conditions

Atmospheric Pressure:
- Range: -25° C to +50° C
- Accuracy: +- .2 kPa

Biomet RH:
- Range: 0-100% – non-condensing
- Accuracy: ±1%

ELECTRONICS

Communication Interfaces:
- SDI-12
- RS-232 (raw 10Hz data)
- USB micro

Integrated GPS:
- Provides location and precision time, including for edge flux processing.
- Supports GPS Time Output (GPST)

Magnetometer:
- Output instrument orientation relative to magnetic north

Accelerometer:
- Output instrument tilt

EMBEDDED SOFTWARE

Software Updates:
Capable of software updates via USB

POWER REQUIREMENTS

Voltage:
- 9 to 33 VDC nominally; Can be powered from a standard USB port (2.0 or newer) for calibration and firmware updates. Outdoor operation from a 5 V USB power supply is not supported.

Power Consumption:
- 1.5 W

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