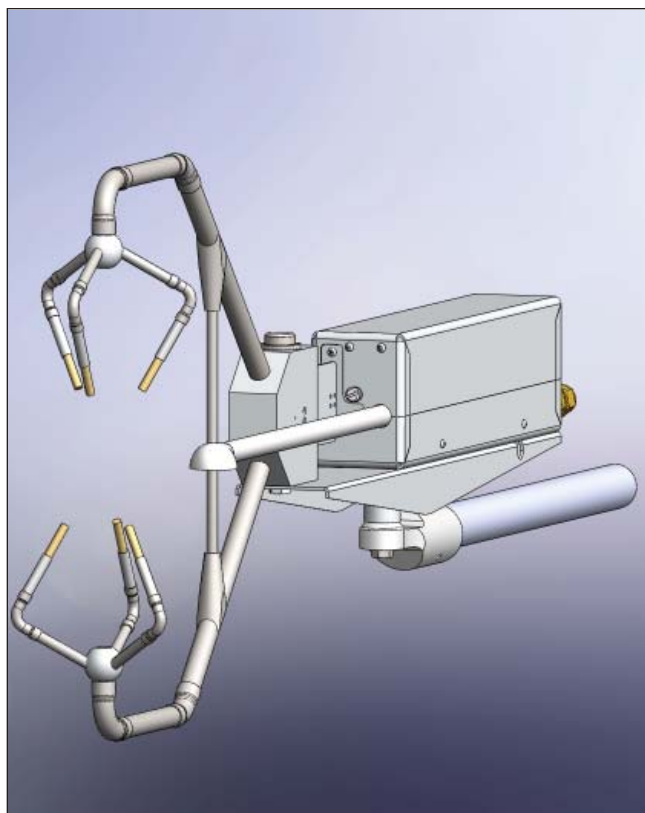
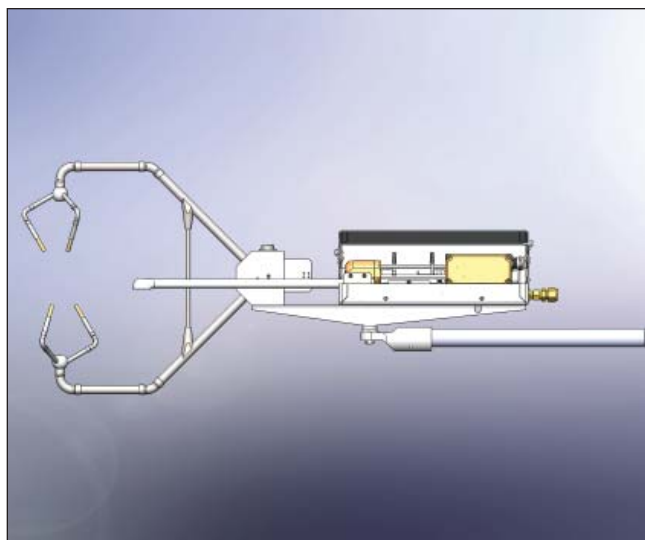


EC155

CO₂ and H₂O Closed Path Gas Analyzer and Optional CSAT3A 3D Sonic Anemometer



EC155 with the optional CSAT3A Sonic Anemometer.



EC155 with the optional CSAT3A Sonic Anemometer.

Campbell Scientific's EC155 is an in-situ closed path analyzer specifically designed for eddy covariance flux measurements. As a stand-alone analyzer, it simultaneously measures absolute carbon dioxide and water vapor densities, sample cell temperature and pressure. With the optional CSAT3A sonic anemometer head, the EC155 also measures three dimensional wind speed and sonic air temperature.

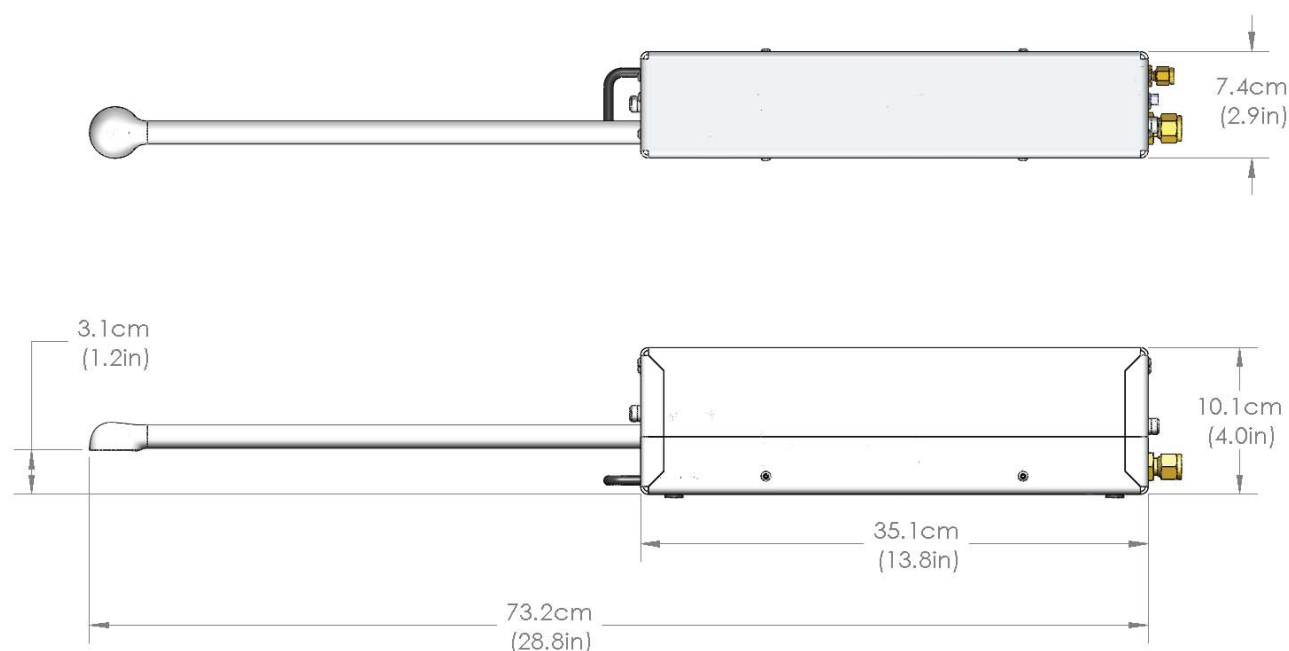
Features/Benefits

- Slim aerodynamic shape with minimal wind distortion
- Measurements are temperature compensated without active heat control
- Co-located analyzer sample intake and sonic anemometer measurement volume
- Integrated analyzer and sonic anemometer mounting
- Analyzer and sonic anemometer measurements are temporally synchronized by a common set of electronics
- Low power consumption; suitable for solar power applications
- Low noise
- Maximum output rate of 50 Hz with 25 Hz bandwidth
- Tolerant to window contamination
- Field rugged
- Field serviceable (easy access to chemical bottles and sample cell)
- Factory calibrated over wide range of CO₂, H₂O, pressure and temperature in all combinations encountered in practice
- Extensive set of diagnostic parameters to warn of questionable data
- Fully compatible with Campbell Scientific dataloggers; field setup, configuration, and field zero and span can be accomplished directly from the datalogger

EC155 Outputs*

- U_x (m/s)
- U_y (m/s)
- U_z (m/s)
- Sonic Temperature (°C)
- Sonic Diagnostic
- CO₂ Density (mg/m³)
- H₂O Density (g/m³)
- Gas Analyzer Diagnostic
- Fast Response Cell Temperature (°C)
- Cell Pressure (kPa)
- CO₂ Signal Strength
- H₂O Signal Strength
- Auxiliary Thermistor (°C)
- Instrument Temperature (°C)
- Infrared Source Usage (hours)

*A CSAT3A Sonic Anemometer is required for the first five outputs.



Ordering Information

Flux Sensors

EC155 CO₂ and H₂O Closed-Path Gas Analyzer

Sensing Heads Options (must choose one)

- GH Gas Analyzer Only
- SH CSAT3A and Gas Analyzer

Pressure Sensor Option (must choose one)

- BB Basic Barometer
- EB Enhanced Barometer

Carrying Cases

- 25990** EC155 Carrying Case without foam insert. It holds both the gas analyzer and sonic anemometer.
- 16764** CSAT3A Carrying Case without foam insert.

Cables

For the following cables, enter the length, in feet after the -L. A 25-ft length is recommended. A cable termination option must be chosen for each of the cables (see below).

- CABLEPCBL-L** Two-conductor, 16-AWG cable with a Santoprene® jacket is used to power the EC155.
- CABLE4CBL-L** Four-conductor, 22-AWG cable with drain wire and Santoprene jacket is used to attach the SDM or Analog Output connector on the EC155 electronics box.
- CABLE5CBL-L** Five-conductor, 24-AWG cable with drain wire and Santoprene jacket is recommended for connecting the EC155 with an MD485 multidrop modem.

Cable Termination Options (must choose one)

- PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW Cable terminates in connector for attachment to a prewired enclosure.

Gas Analyzer Specifications^a

Refer to CSAT3 Product Brochure for Sonic Anemometer Specifications

Factory Calibrated Range

CO ₂ :	0 to 1000 ppm (0 to 2180 mg/m ³)
H ₂ O:	0 to 51 ppt (-60° to +35°C dew point)
Ambient Temperature:	-30° to +50°C
Pressure:	75 to 101.5 kPa

Operating Temperature: -30° to +50°C

Power: 4.8 W (steady state and power-up) at 10 to 16 Vdc

Sample Cell Volume: 5.93 cm³ (0.360 in³)

Fundamental Measurement Rate: 150 Hz

Output Rate: 5 to 50 Hz; user programmable

Output Bandwidth: 5, 10, 12.5, 20, or 25 Hz; user programmable

Output Signal: SDM, RS-485, USB, 2 16-bit DACs for CO₂ and H₂O (0 to 5 Vdc)

Auxiliary Inputs: air temperature and pressure

Dimensions

Head Housing Diameter:	3.2 cm (1.25 in)
Head Length:	29.7 cm (11.7 in)
Electronics Box:	24.1 cm x 35.6 cm x 14 cm (9.5 in x 14 in x 5.5 in)

Weight

Head and Cable:	1.8 kg (4.0 lbs)
Sample Cell (shell, plumbing, and heated intake):	2.1 kg (4.5 lbs)
Platform:	0.4 kg (0.9 lbs)
Electronics Box:	3.2 kg (7 lbs)

Cable Length: 3 m (9.8 ft) from sensor to control box

Noise RMS (maximum)^b

CO ₂ :	0.109 µmol/mol (0.2 mg/m ³)
H ₂ O:	0.00468 mmol/mol (0.00350 g/m ³)

CO₂ Performance

Zero Temperature Drift (maximum)^c

-30° to 15°C:	±0.0820 µmol/mol/°C (±0.15 mg/m ³ /°C)
15° to 35°C:	±0.137 µmol/mol/°C (±0.25 mg/m ³ /°C)
35° to 50°C:	±0.164 µmol/mol/°C (±0.3 mg/m ³ /°C)

Total Temperature Drift (maximum)^{c, d}

-30° to 35°C:	±0.164 µmol/mol/°C (±0.3 mg/m ³ /°C)
35° to 50°C:	±0.219 µmol/mol/°C (±0.4 mg/m ³ /°C)

Gain Drift (maximum): ±0.1% of reading/°C

Sensitivity to H₂O

(maximum): 8 x 10⁻⁵ molCO₂/molH₂O

H₂O Performance

Zero Temperature Drift (maximum)^c

-30° to 0°C:	±0.0134 mmol/mol/°C (±0.01 g/m ³ /°C)
0° to 50°C:	±0.00668 mmol/mol/°C (±0.005 g/m ³ /°C)

Total Temperature Drift (maximum)^e

15° to 45°C:	±0.0134 mmol/mol/°C (±0.01 g/m ³ /°C)
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Gain Drift (maximum): ±0.15% of reading/°C

Sensitivity to CO₂

(maximum): ±0.05 molH₂O/molCO₂

^aSubject to change without notice.

^bThe noise RMS specifications assume 25°C, 85 kPa, 14 g/m³ water density, 597 mg/m³ CO₂ density, and 25 Hz bandwidth.

^cTemperature at 20°C and pressure at 101.325 kPa.

^dThe specification for the CO₂ total temperature drift is at 731.6 mg/m³ or 400 µmol/mol and instrument spanned at 25°C.

^eThe specification for the H₂O total temperature drift is at 9 g/m³ or 10°C dew point; instrument spanned at 25°C.

