



Automated Monitoring Sensors

Sensors for Agriculture Applications

Rugged, Reliable, and Ready for any Application



Almost any sensor can be measured by our dataloggers, allowing stations to be customized for each site. Typical sensors used on our stations include, but are not limited to: wind speed, wind direction,

solar radiation, air and soil temperature, relative humidity, precipitation, soil moisture, barometric pressure, and leaf wetness.

WIND SPEED & DIRECTION

	Sensor	Wind Speed		Wind Direction	
		Range	Accuracy	Range	Accuracy
03002 Wind Sentry Set Reliable, competitively-priced; good all purpose wind set		3-cup anemometer and vane	0 to 50 m/s (112 mph) ±0.5 m/s (1.1 mph)	0 to 360° (mechanical) 0 to 352°, 8° open (electrical)	±5°
034B Wind Set Reliable, accurate wind measurements		3-cup anemometer and vane	0 to 50 m/s (110 mph) < 10.1 m/s (22.7 mph): ±0.11 m/s (0.25 mph) > 10.1 m/s (22.7 mph): ±1.1% of true	0 to 360° (mechanical) 0 to 356°, 4° open (electrical)	±4°
05103 Wind Monitor Light-weight, sturdy instrument		helicoid-shaped, 4-blade propeller and fuselage-shaped sensor body	0 to 100 m/s (0 to 224 mph) ±0.3 m/s (0.6 mph) or 1% of reading	0 to 360° (mechanical) 0 to 355°, 5° open (electrical)	±3°

TEMPERATURE & RELATIVE HUMIDITY

	Sensor	Relative Humidity		Sensor	Temperature	
		Measurement Range	Accuracy (at 25°C)		Measurement Range	Accuracy
HMP155A Accurate, Wide Temperature Range Higher end sensor		HUMICAP®180R (recalibratable)	0.8 to 100% RH ±1% to ±1.7% depending on RH	PT100 RTD	-80° to +60°C	±(0.055 - 0.0057 x temperature)°C
HC2S3 Accurate and Rugged Superior performance and reliability		ROTRONIC® Hygromer IN-1 (recalibratable)	0 to 100% RH ±0.8% RH with standard configuration settings	PT100 RTD	-40° to +60°C	±0.1°C with standard configuration settings
CS215 SDI-12 Output Competitively priced, general purpose		Sensirion (SHT75)	0 to 100% RH ±2% to ±4%, depending on RH	Sensirion (SHT75)	-40° to +70°C	±0.3°C at 25°C; ±0.4°C (+5° to +40°C); ±0.9°C (-40° to +70°C)

More info: 435.227.9120

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BAROMETRIC PRESSURE

CS100 | Standard Barometer

Resides inside weather-proof enclosure



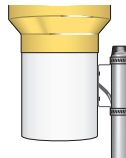
Measurement Range	Elevation*	Temperature Range	Accuracy	Current Consumption
600 to 1100 mb ^b	~ 2000 ft below sea level (as in a mine) to 12,000 feet above sea level	-40° to 60°C	±0.5 mb @ +20°C; ±1.0 mb @ 0° to 40°C; ±1.5 mb @ -20° to +50°C; ±2.0 mb @ -40° to +60°C	< 3 mA (active); < 1 µA (sleep mode)
500 to 1100 mb	~ 2000 ft below sea level (as in a mine) to 15,000 feet above sea level	-40° to 60°C	±0.3 mb @ +20°C; ±0.6 mb @ 0° to 40°C; ±1.0 mb @ -20° to +45°C; ±1.5 mb @ -40° to +60°C	< 4 mA (active); < 1 µA (sleep mode)

*The CS100 is available in special ranges of 500 to 1100 and 800 to 1110; contact Campbell Scientific for more information.

PRECIPITATION

TE525WS | Rain Gage

8-inch orifice meets the National Weather Service recommendations. Compatible with the CS705 snowfall adapter.



TB4 | High-End Rain Gage

Accurate and Ideal for high-intensity precipitation



CS700H | High-End Electrically Heated Rain and Snow Gage

Rugged, accurate, and ideal for high-intensity precipitation, even in freezing conditions



Sensor Type	Orifice Diameter	Resolution (Rainfall per Tip)	Accuracy	Operating Temperature
Tipping bucket with magnetic reed switch	20.3 cm (8 in)	0.01 in (0.254 mm)	Up to 1 in./hr: ±1% 1 to 2 in./hr: +0, -2.5% 2 to 3 in./hr: +0, -3.5%	0° to +50°C
Tipping bucket with siphon and dual reed switch	20 cm (7.9 in)	0.01 in (0.254 mm)	better than ±2% at 500 mm/hr (19.7 in./hr)	0° to 70°C
Tipping bucket with siphon and dual reed switch	20 cm (7.9 in)	0.01 in (0.254 mm)	better than ±2% at 500 mm/hr (19.7 in./hr)	-40° to 70°C

SOIL MOISTURE

CS616 | Reflectometer with 30-cm Rods

High accuracy and precision; designed for long-term monitoring



CS625 | Reflectometer for CR200(X)-series Loggers

High accuracy and precision; designed for long-term monitoring



CS650 | Reflectometer with 30-cm Rods

Innovative and more accurate in soils with high bulk EC without site-specific calibration



CS655 | Reflectometer with 12-cm Rods

Innovative and more accurate in soils with high bulk EC without site-specific calibration



Measurements	Water Content Accuracy	Water Content Precision	Current Drain
volumetric water content of porous media (such as soil)	±2.5% VWC using standard calibration with bulk EC of ≤0.5 dS m ⁻¹ , bulk density of ≤1.55 g cm ⁻³ , and measurement range of 0% to 50% VWC	0.05%	65 mA @ 12 Vdc (when enabled) 45 µA (quiescent typical)
volumetric water content of porous media (such as soil)	±2.5% VWC using standard calibration with bulk EC of ≤0.5 dS m ⁻¹ , bulk density of ≤1.55 g cm ⁻³ , and measurement range of 0% to 50% VWC	0.05%	65 mA @ 12 Vdc (when enabled) 45 µA (quiescent typical)
soil electrical conductivity (EC), relative dielectric permittivity, volumetric water content, soil temperature	±3% VWC typical in mineral soils, where solution EC ≤3 dS/m	< 0.05%	Active (3 ms): 45 mA typical @ 12 Vdc (80 mA @ 6 Vdc, 35 mA @ 18 Vdc) Quiescent: 135 µA typical @ 12 Vdc
soil electrical conductivity (EC), relative dielectric permittivity, volumetric water content, soil temperature	±3% VWC typical in mineral soils, where solution EC ≤10 dS/m	< 0.05%	Active (3 ms): 45 mA typical @ 12 Vdc (80 mA @ 6 Vdc, 35 mA @ 18 Vdc) Quiescent: 135 µA typical @ 12 Vdc

SOLAR RADIATION—QUANTUM

LI190R | Quantum Sensor
Accurate and versatile



Sensor	Measurement Description	Spectral Range	Sensitivity	Operating Temperature
silicon photovoltaic detector mounted in a cosine-corrected head	Measures Photosynthetic Photon Flux Density (PPFD), in both natural and artificial light	400 to 700 nm	Typically 5 μA per 1000 $\mu\text{moles s}^{-1} \text{m}^{-2}$	-40° to +65°C

SOLAR RADIATION—TOTAL INCOMING

CS300 | Silicon Pyranometer
Accurate, dependable, and ideal for long-term deployment in harsh conditions



Sensor	Measurement Description	Spectral Range	Sensitivity	Operating Temperature
silicon photovoltaic detector mounted in a cosine-corrected head	Measures sun plus sky radiation	300 to 1100 nm	0.2 mV/Wm ⁻²	-40° to +55°C

LI200RX | Silicon Pyranometer
Accurate and dependable



silicon photovoltaic detector mounted in a cosine-corrected head	Measures sun plus sky radiation	400 to 1100 nm	0.2 kW m ⁻² mV ⁻¹	-40° to +65°C
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LP02 | ISO-Second-Class Pyranometer
High Quality device with protective dome



Blackened thermopile protected by a dome	Monitors solar radiation for the full solar spectrum range	305 to 2800 nm	15 $\mu\text{V/W/m}^2$	-40° to +80°C
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CMP3 | ISO-Second-Class Pyranometer
Protective Glass Dome and Solar Shield



Blackened thermopile protected by a dome	Monitors solar radiation for the full solar spectrum range	310 to 2800 nm	5 to 20 $\mu\text{V/W/m}^2$	-40° to +80°C
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LEAF WETNESS

237 | Wetness Sensing Grid
Determines electrical resistance on the surface of the sensor



Operating Temperature Range	Dimensions	Weight	Requires Painting?	Requires Field Calibration?
-40° to 150°C; sensor may crack if the temperature drops below -40°C	7.1 x 7.6 x 0.64 cm (2.75 x 3.0 x 0.25 in)	91 g (3 oz) with 10 ft cable	Yes	Yes

LWS | Wetness Sensing Grid
Detects the presence of water or ice anywhere on the sensor's surface



-20° to 60°C	11.2 x 5.8 x 0.075 cm (4.4 x 2.3 x 0.0295 in.)	0.14 kg (5 oz) with 15 ft cable	No	No
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SURFACE TEMPERATURE (PLANT CANOPY)

SI-111 | Precision Infrared Radiometer
Determines surface temperature of an object without physical contact



Field of View (FOV)	Target Temperature Output Signal	Wavelength Range	Absolute Accuracy	Repeatability
22° half angle	60 μV per °C difference from sensor body	8 to 14 μm (corresponds to atmospheric window)	$\pm 0.2^\circ\text{C}$ (-10° to +65°C) $\pm 0.5^\circ\text{C}$ (-40° to +70°C)	$\pm 0.05^\circ\text{C}$ (-10° to +65°C) $\pm 1^\circ\text{C}$ (-40° to +70°C)

WATER, SOIL, AND AIR TEMPERATURE

109 | Temperature Probe
Rugged, Accurate, Versatile



Sensor	Measurement Range	Steinhart-Hart Equation Error	Time Constant in Air	Tolerance
BetaTherm 10K3A11B Thermistor	-50° to +70°C	0.03°C at -50°C(maximum)	30 to 60 s in a wind speed of 5 m s ⁻¹	$\pm 0.2^\circ\text{C}$ over 0° to 70°C range

108 | Temperature Probe
Rugged, Accurate, Versatile



BetaTherm 100K6A11A Thermistor	-5° to +95°C	$\leq \pm 0.01^\circ\text{C}$ over measurement range	30 to 60 s in a wind speed of 5 m s ⁻¹	$\pm 0.2^\circ\text{C}$ over 0° to 70°C range
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