



Lightning Danger Detector

Lifesaving warning
before lightning strikes

Overview

The CS110 is used for lightning warning applications and in research applications for measuring the local electric field. It measures the vertical component of the atmospheric electric field at the earth's surface. The CS110 sensor is

typically part of a larger electric-field system. It includes an integrated CR1000 datalogger, and so can be expanded with the addition of other sensors and peripherals.

Benefits and Features

- › Low power consumption
- › Senses potential for lightning, providing warning before lightning strikes
- › Easy maintenance—stator easily removed for cleaning
- › Extensive diagnostic self-checking for each measurement reduces or eliminates scheduled maintenance
- › Rugged construction
- › SG000 Strike Guard can be used in conjunction with our CS110 to create a complete lightning-threat measurement and analysis system

Technical Description

The CS110 uses a reciprocating shutter instead of the traditional rotating vane field mill. The reciprocating shutter is electrically connected to ground potential by a flexible stainless-steel strap. The strap operates below its fatigue limit, resulting in an ultra-reliable electrical ground connection to the shutter.

The reciprocating approach provides better low-frequency error performance than the traditional rotating vane field mill because it has a convenient zero-field (closed shutter) reference. The zero-field reference allows the CS110 to measure and then correct for electronic offset voltages, contact potentials, and leakage currents of each individual measurement (Patent Pending).

The CS110 also contains circuitry to measure and compensate for insulator leakage currents occurring on the charge amplifier input, eliminating measurement errors caused by fouled insulators. If insulator surfaces become conductive because of surface contamination, a leakage current compensation circuit applies an equal and opposite polarity current to the charge-amplifier input that prevents saturation of the electronics.

Warranty

The CS110 has a one year warranty against defects in materials and workmanship. Campbell Scientific does not warrant that the CS110 will meet customer's requirements or that its operation will be uninterrupted or error-free.

Atmospheric or local electric field conditions or different site characteristics may cause false information, late data, or otherwise incomplete or inaccurate data. The CS110 only measures conditions that make lightning more likely. Just as with weather forecasts, the CS110 measurements only help assess the probability of lightning. Lightning can occur

causing personal injury, even death, or damage to property without any warning from the CS110.

Campbell Scientific is not liable for special, indirect, incidental, or consequential damages from the use, failure, or malfunction of the CS110. A full statement of the CS110's Warranty is contained in the CS110 Manual.

Specifications

-NOTE-	<i>An embedded CR1000M datalogger module (ordered as pn #18292) is required for every CS110 purchased; see Common Accessories section on Ordering Information page.</i>
CE Compliance Standards to which Conformity Is Declared	BS EN61326:2002
Lightning Protection	Multi-stage transient protection on all external interfaces
Power Requirements	11 to 16 Vdc
Baud Rates	Selectable from 300 to 115.2k bps
ASCII Protocol	One start bit, one stop bit, eight data bits, no parity
Operating Temperature Range	<ul style="list-style-type: none"> › -40° to +85°C (extended) › -25° to +50°C (standard)
Operating Relative Humidity	0 to 100% RH
Mounting	Vertical pipe with outer diameter of 1.91 to 6.35 cm (0.75 to 2.5 in.)

Communication Ports	<ul style="list-style-type: none"> › 1 CS I/O port used to interface with Campbell Scientific peripherals, such as a COM320 Voice Modem › 1 RS-232 port › Digital Control Ports 1, 2, and 3 for alarm, asynchronous communications, or SDI-12 communications
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Dimensions	15.2 x 15.2 x 43.2 cm (6 x 6 x 17 in.)
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Weight	4 kg (9 lb)
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Current Drain

Peak Current Demand	750 mA (occurs during motor operation)
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Average	<ul style="list-style-type: none"> › 7 mA (at 1 sample per 10 s) › 300 mA (at 5 samples per 1 s) › 120 mA (at 2 samples per 1 s) › 60 mA (at 1 sample per 1 s)
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Accuracy

-NOTE-	Refer to the sensor manual for resolution, sensitivity, and noise specifications.
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Parallel-Plate Configuration	$\pm 1\%$ of reading + 60 V m ⁻¹ offset
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2 m CM110 Tripod Configuration	$\pm 5\%$ of reading + 8 V m ⁻¹ offset
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For comprehensive details, visit: www.campbellsci.eu/cs110 



80 Hathern Road, Shepshed, LE12 9GX UK | +(0)1509 828888 | sale@campbellsci.co.uk | www.campbellsci.eu
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