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CS140

Background Luminance Sensor

High-Performance Sensor at an Economical Price

Overview

The CS140 is a high-quality background luminance sensor. It provides the luminance data required to assess the visibility range for lights such as runway lights or warning lights.

The field of view and elevation angle follow aviation practice, and the spectral response follows the CIE curve that matches the typical response of the human eye.

The CS140 meets the standards required for Runway Visual Range, as well as the standards of ICAO, the UK CAA and the FAA. (This includes CAP670 and CAP746.)

Learn more about our CampbellAero™ Automated Weather Observing System (AWOS) Solution and our CampbellAero Software.

Benefits and Features

- Monitoring of internal supply voltages and temperatures
- Elevated field of view with hood horizontal to give high resistance to contamination on the window
- RS-232/RS-485 outputs so can operate independent of a host visibility sensor for flexible, reliable operation
- Automatic window contamination detection
- Configurable window contamination correction
- High-performance sensor at a competitive price
- Incorporates automatic dew and hood heaters for all-weather operation
- Low power consumption; suitable for solar-power applications

Detailed Description

The CS140 Background Luminance Sensor accurately measures background luminance over a wide range from 0 cd/m^2 to a maximum of 45,000 cd/m^2

The CS140 uses a photodiode with a spectral response close to the CIE human eye model and removes any unwanted wavelengths via an inbuilt band-pass filter.

The CS140 features a fixed 6° field of view as specified by the FAA. For ease of installation, the CS140 is simply mounted horizontally with the required 6° inclination already built into the design. (Other angles are possible via the sensor mounting bracket.)

The CS140 features a heated hood to prevent ice and snow from building up, dew heaters to prevent condensation on the glass window, and a dirty window detection system to measure window contamination.

The design is undamaged when pointed directly at the sun, allowing complete flexibility in orientation.

The CS140 has a rugged IP66 rated environmental enclosure that protects it from the harshest conditions and measures the atmosphere with high stability and repeatability.

Specifications

Measurement Range	0 to 45,000 cd/m^2
Accuracy	❱ ±0.2cd/m^2 (< 2cd/m^2) ❱ ±10% (> 2cd/m^2)
Operating Temperature	❱ -25° to +60°C (standard) ❱ -50° to +70°C or -40° to +70°C (extended, optional)
Operating Humidity	0 to 100%
Wind Speed	Up to 60 m/s
Sensor Sealing	Rated to IP66
Response Time	1 s
Mountings	Stainless-steel V-bolt mounting to pole Diameter 3.2 to 5.25 cm (1.26 to 2.07 in.)
Sensor Dimensions	36 x 18 x 9 cm (14.2 x 7.1 x 3.5 in.)
Weight	~2.4 kg (~5.3 lb) dependent upon mounting system
Shipping Weight	3.5 kg (7.7 lb)

Electrical

-NOTE-	*Lower power states can be achieved by less frequent sampling and remote control of heaters.* *Optional power supplies with battery back-up available.* *A low-voltage shutdown level can be set to prevent back-up batteries from being damaged.*
Electronics Supply Voltage	9 to 24 Vdc
Hood Heater Supply Voltage	24 V dc or ac
Hood Heater Power	48 W
Dew Heater Power	0.6 W
Total Unit Power	< 1.5 W while sampling continously (including dew heater)

Interface

Serial Interface	❱ RS-232 (full duplex, no hardware handshaking) ❱ RS-485 (half duplex only)
Serial Data Rates	1200 to 115,200 bps (38,400 bps default rate)

Optical

-NOTE-	*Lens contamination circuitry monitors the window for contamination. The sensor can be configured to adjust calibration for contamination.*
Field of View (FOV)	6° wide with sharp cut-off
Elevation Angle	6° with hood horizontal
Resolution	0.1 cd/m^2

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