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WHEN MEASUREMENTS MATTER

CS125 Aviation System

Visibility, Background Luminance, and Present Weather Monitoring in One Package

Overview

The CS125 Aviation System combines the very best of visibility, background luminance, and present weather monitoring in one package, leveraging the tried-and-true technology of Campbell Scientific products specific to the aviation industry.

At the heart of this system is the CS125 Present Weather and Visibility Sensor, known for its exceptional performance and value. Its future-proof design allows for easy expansion, accommodating new sensors and systems without the need for a complete unit replacement, thereby reducing future costs.

Supporting the CS125 are the CS140 Background Luminance Sensor and HygroVue™5 Digital Temperature and Relative Humidity Sensor components.

- The CS140 provides a high-quality background luminance measurement to allow better visibility measurements in low light conditions.
- The HygroVue 5 enables precise atmospheric moisture inputs to the present weather algorithms, ensuring the highest accuracy of freezing and frozen hydrometeors, as well as dry lithometeors.

This specific sensor combination makes the CS125 Aviation System a comprehensive yet cost-effective solution for your aviation weather monitoring needs, delivering accurate, real-time weather data you can trust to assist in timely airport operation decisions.

The CS125 Aviation System pairs seamlessly with CampbellAero™ Software to offer enhanced capabilities, providing real-time, reliable, and accurate weather data. Discover more about the CampbellAero Solution and the CampbellAero Software for improved operational efficiency and safety.

Benefits and Features

- Comprehensive and elegant aviation weather monitoring solution to save costs and infrastructure
- Integrated visibility, present weather, background luminance, ambient air temperature, wet-bulb temperature, and relative humidity in one package for superior performance and accuracy
- Advanced forward-scatter optical sensors for accuracy, reliability, and lower running costs
- Future-proof design for return on investment and expansion plans
- Lengthy visibility range of 0 to 100 km (0 to 62 mi)
- Outputs of up to three concurrent precipitation codes (METAR) and 57 SYNOP codes

- Additional service port for convenience and time-on-site reduction
- Direct input from the CS140 to the CS125 without needing an additional data logger
- Optional heating for electronics housing located in heavy snowfall areas
- Reduced infrastructure costs and environmental footprint

Detailed Description

The CS125 Aviation System is a comprehensive solution for visibility and present weather monitoring, integrating several advanced components.

CS125 Present Weather and Visibility Sensor

At its core is the CS125, which employs a forward-scatter system with a 42° scatter angle for visibility measurements. Precipitation particles are identified based on scattering properties that determine a drop size distribution (DSD). The critical distinction of identifying freezing and frozen hydrometeors is made using the superior proprietary wet-bulb threshold. World Meteorological Organization (WMO)-compliant downward-pointing optics minimize contamination, while high-speed sampling of 1 kHz reduces errors during mixed-weather events. The CS125 offers several aviation-compliant data outputs, window heating to prevent condensation and remove contamination, and anti-icing hood heaters for the most extreme environments. The sensor continuously monitors its status, reporting any faults and lens contamination, and it features user-configurable alarm outputs for alerts.

CS140 Background Luminance Sensor

The CS140 measures luminance from 0 to 45,000 cd/m^2 using a photodiode—with a spectral response mimicking those observed by the human eye—(International Commission on Illumination [CIE], 1931) that is connected directly to the CS125 to allow day/night algorithm switching for superior visibility measurement accuracy in all conditions. It features a fixed 6° field of view and inclination adjustments as required by aviation regulating bodies, a heated hood to prevent ice and snow buildup, dew heaters to prevent condensation, and a dirty window detection system.

HygroVue 5 Digital Temperature and Relative Humidity Sensor

The HygroVue 5 completes the system by providing precise ambient air temperature, wet-bulb temperature, and relative humidity measurements. It features a user-replaceable, individually calibrated chip element and a protective filter to minimize contaminants from dust, dirt, or pollutants while allowing sufficient air exchange. The wet-bulb temperature measurement is used as a superior detection threshold for freezing and frozen precipitation, while the relative humidity measurement is used per aviation guidelines for mist or haze thresholds that vary from region to region. Relative humidity measurements are also used to assist in dry lithometeor detection, such as smoke or dust storms, ensuring that better operational decisions can be made with confidence.

The Total Solution

Together, these components form a robust and reliable solution for comprehensive aviation weather monitoring without any further infrastructure requirements, ensuring cost-effective, accurate, and timely weather data that meet the aviation industry's demanding requirements.

Additionally, by integrating the CS125 Aviation System with CampbellAero Software, you can achieve enhanced capabilities, providing real-time, reliable, and precise weather information for air traffic controllers, meteorological observers, and maintenance personnel.

Specifications

Maximum Reported Visibility	100 km (62.1 mi)
Background Luminance Measurement Range	0 to 45,000 cd/m^2
Present Weather Outputs	- 57 SYNOP present weather codes and associated METAR and NWS present weather codes; past weather codes - Present and past weather: identifies as standard mist, fog, drizzle, freezing drizzle, drizzle and snow, rain, freezing rain, rain and drizzle, rain and snow, snow, and hail.
Precipitation Intensity	Yes
Precipitation Accumulation	Yes
Operating Temperature Range	-40 to +70°C

Material	Stainless steel and hard-anodized aluminum, powder coated
Electronics Supply Voltage	12 or 24 Vdc
Serial Interface	RS-232 or RS-485
Component Specifications	For additional detailed specifications, refer to the individual product pages:

- CS125 Present Weather and Visibility Sensor
- CS140 Background Luminance Sensor
- HygroVue 5 Digital Temperature and Relative Humidity Sensor

For comprehensive details, visit: www.campbellsci.com/cs125-aviation-system

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