



CS516-QD

Fuel Moisture and Temperature Sensor with Fuel Sticks for RAWS-F Station



Overview

The CS516-QD consists of a [CS506 Fuel Moisture Probe](#), a [26601 10-hour Fuel Moisture Stick](#), a [CS205 Fuel Temperature Stick](#), and a [107 Temperature Probe](#) mounted on a [26817 Mounting Stake](#). The cables on the CS506 and 107 probes

terminate in a military style connector instead of pigtails. The connector attaches to the RAWS-F Fire Weather Quick Deployment Station.

Detailed Description

Fuel temperature is measured by inserting the thermistor-based 107 probe inside of the CS205 dowel. Dowel replacement is recommended every spring; more frequent replacement may be required in some environments (i.e., those with a large number of wet/dry cycles).

The CS506 Fuel Moisture Sensor consists of an epoxy-encapsulated electronics package. It uses Time Domain Reflectometry to measure the moisture content of the USFS-specified, 10-hour, ponderosa pine dowel. No artificial materials (e.g., epoxy sealant) are added to the dowel that would adversely influence the natural behavior characteristics

of it. Because the complete dowel surface is accessible for moisture exchange, the response of the CS506 is similar to that of the traditional weighing racks.

To optimize probe-to-probe repeatability and to allow probe interchangeability without individual calibration, two additional sorts are performed on the dowels before they are selected to be used as a sensor. First, the dowels are sorted dry by density to improve accuracy in the dry range of 0 to 15%. Second, the dowels are sorted after a 50-minute soak by weight to reduce probe-to-probe time response variation and minimize variability in the wet range of 20 to 50%.

Specifications

Cable Length	3.7 m (12 ft)
Weight	2.4 kg (5.29 lb)
Fuel Moisture	
Operating Range	0 to 70% moisture content

Power Supply	5 to 18 Vdc
Enable Voltage	› Off at 0 Vdc (< 1 Vdc) › On at 5 Vdc (> 4 Vdc; maximum 18 Vdc)
Current Use	› 45 μA (quiescent) › 65 mA (active)



Output Signal ± 0.7 Vdc square wave (with an output frequency of approximately 31 to 58 kHz)

Fuel Temperature

Sensor	BetaTherm 100K6A1B Thermistor
Tolerance	$\pm 0.2^{\circ}\text{C}$ (over 0° to 50°C range)
Temperature Measurement Range	-35° to $+50^{\circ}\text{C}$
Steinhart-Hart Equation Error	$\leq \pm 0.01^{\circ}\text{C}$ (over measurement range)

Fuel Moisture Accuracy

0 to 10% Range	$\gg \pm 1.25\%$ (worst case) $\gg \pm 0.74\%$ (RMS error)
10 to 20% Range	$\gg \pm 0.9\%$ (RMS error) $\gg \pm 2\%$ (worst case)
20 to 30% Range	$\gg \pm 1.94\%$ (RMS error) $\gg \pm 3.4\%$ (worst case)
30 to 50% Range	$\gg \pm 4.11\%$ (worst case) $\gg \pm 2.27\%$ (RMS error)

For comprehensive details, visit: www.campbellsci.com/cs516qd 



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