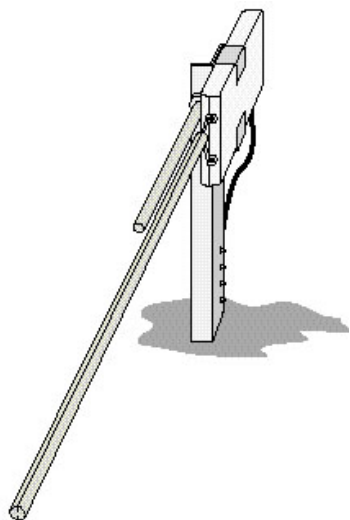


CS505 & CS205 10-Hour Fuel Moisture/ Temperature Sensors



Description

Automated fuel moisture measurements can be made using Campbell Scientific's CS505 Fuel Moisture sensor, and automated fuel temperature measurements with Campbell Scientific's CS205/107 sensor. The probes provide fuel moisture and temperature measurements of a 10-hour fuel moisture dowel. The status of small-diameter (10-hour) forest fire fuels is reported as % moisture by weight (1%=1 g). These sensors are compatible with CR510, CR10X and CR23X dataloggers, and can be added to tripod or tower-based weather stations. Data can be stored in the datalogger and telemetered back to your office via RF radio, cellular phone or satellite systems, facilitating updated reports on site conditions and eliminating the need to make manual measurements.

The CS505 measures the moisture content of a ponderosa pine dowel that is fabricated to United States Forestry Service (USFS) specifications. The dowels have the same 12.7mm diameter x 508mm long dimensions as those used on the traditional weighing fuel moisture racks. The dowels used undergo two additional sorts to optimise probe-to-probe repeatability and to allow probe interchangeability without individual calibration.

For automated fuel moisture and fuel temperature measurements

The CS505 Fuel Moisture Sensor produces a ± 2.5 volt square wave. The frequency of the square wave is read with an analogue or pulse channel of a Campbell Scientific datalogger and is converted to percent fuel moisture using a quadratic calibration. The response is similar to the traditional weighing racks because the entire dowel surface is exposed for moisture exchange.

The dowels of the CS505 fuel moisture stick and CS205 fuel temperature stick are easily replaced in the field using a Phillips screwdriver and an adjustable wrench. Dowels are normally replaced each Spring, but more frequent replacements may be required in some environments. The more wet/dry cycles the dowels experience, the more frequently they will need to be replaced.

To measure fuel temperature, both the CS205 fuel temperature stick and the 107 temperature probe are required. The CS205 is a ponderosa-pine dowel also fabricated to USFS specifications, but with a hole bored into one end. A thermistor-based 107 probe is inserted into the CS205, and measures the temperature inside the dowel. The CS205 and the 107 are sold separately. The CS505 Fuel Moisture/Temperature stake is used to mount both the CS505 and the CS205 probes approximately 300mm above the forest floor. Because the probes are mounted parallel to each other, shadowing is minimised.

Key Features

Automatic measurement of both fuel moisture and fuel temperature

Simple mounting for combined sensors

Dowel fabricated to United States Forestry Service (USFS) specifications

Interchangeable dowels easily replaced without special tools

Direct connection to Campbell Scientific dataloggers

Remote data retrieval options can eliminate the need for manual measurements and reduce site visits

Specifications

CS505 Specifications

Operating Range: 0 to 70% moisture content

Fuel Moisture Accuracy:

Range	Worst Case	RMS Error
0 - 10%	±2%	±1%
10 - 20%	±3%	±1.5%
20 - 30%	±5%	±2.2%
30 - 40%	±8%	±2.4%
40 - 70%	±12% (est.)	

Power Supply: 9 to 18V DC
Enable Voltage: 1.3 to 20V DC
Current Use: 70mA active;
 10µA standby

Output Signal: ±2.5V DC square wave
 with an output frequency
 of 600 to 1500Hz

CS205/107 Temperature Probe Specifications

Temperature Measurement Range:
 -35° to +50°C

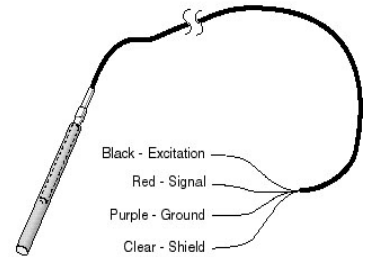
Polynomial Linearisation Accuracy:
 Typically <±0.5°C over -38° to +50°C range
 <±0.1°C over -24° to +48°C range

Interchangeability Error:
 Typically <±0.2°C over 0° to 50°C range

Sensing Unit: Betatherm 100K6A1 Thermistor



CS505 Fuel Moisture Sensor and CS505 10-hour Fuel Moisture Stick



CS205 10-hour Fuel Temperature Stick with 107 Temperature Probe

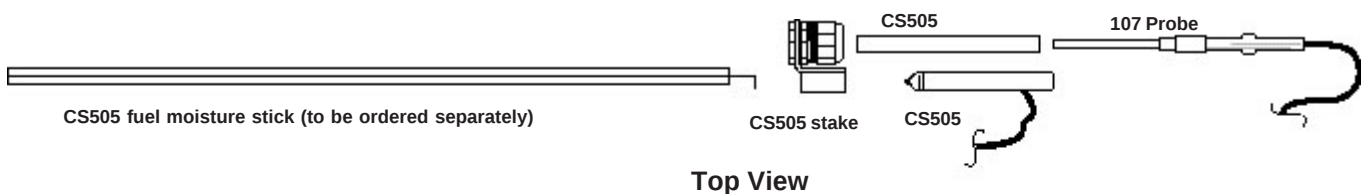
Ordering Information

For a complete CS505 assembly, order the following items:

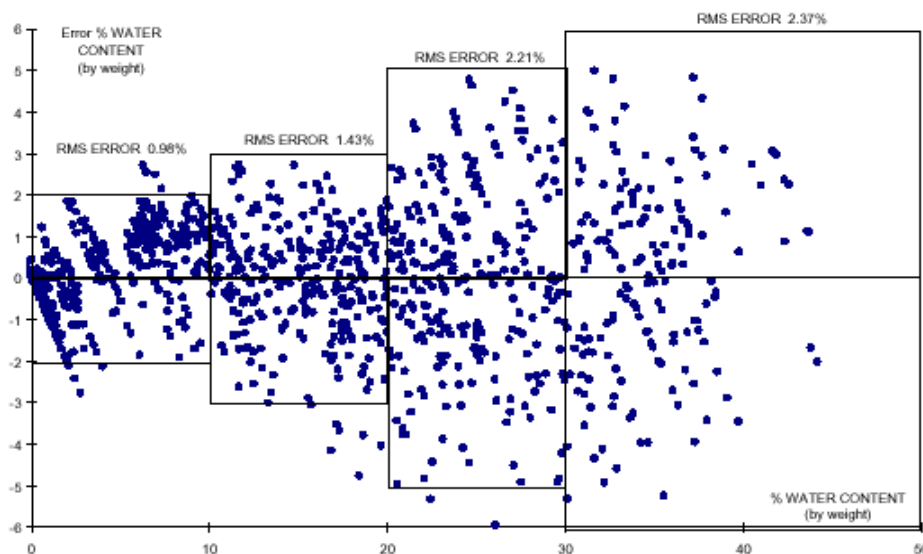
CS505 Fuel Moisture Sensor (Specify the lead length in metres)
 CS505 10-hour Fuel Moisture Stick
 CS505 Mounting Stake

For the CS205, order the following items:

CS205 10-hour Fuel temperature Stick
 107 Temperature Probe (-35°C to +50°C)
 (specify the lead length in metres – standard length is 3 metres)



EXPERIMENTAL DATA ERROR DISTRIBUTION



Campbell Scientific offers a complete range of sensors – ask for a summary leaflet

Campbell Scientific products are available from: