



PRODUCTS

# DC FUEL PROBES

WITH GROUNDED OUTER TUBE

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LMS' DC Fuel Probe is compatible with a 200v/m EMI environment. The probe utilizes two graphite composite tubes as the capacitive elements. The outer tube is grounded to the airframe which provides a Faraday cage shield around the probe components. This design shields the diodes from the 200v/m EMI levels. The two tubes are structurally joined by a nickel-plated cap or flange, and linked to the system with an EMI connector. The design protects the probe elements from arcing. The weight reduction benefit is especially noticeable when compared with metal two tube and three-tube designs.

## Fuel Density Measurement

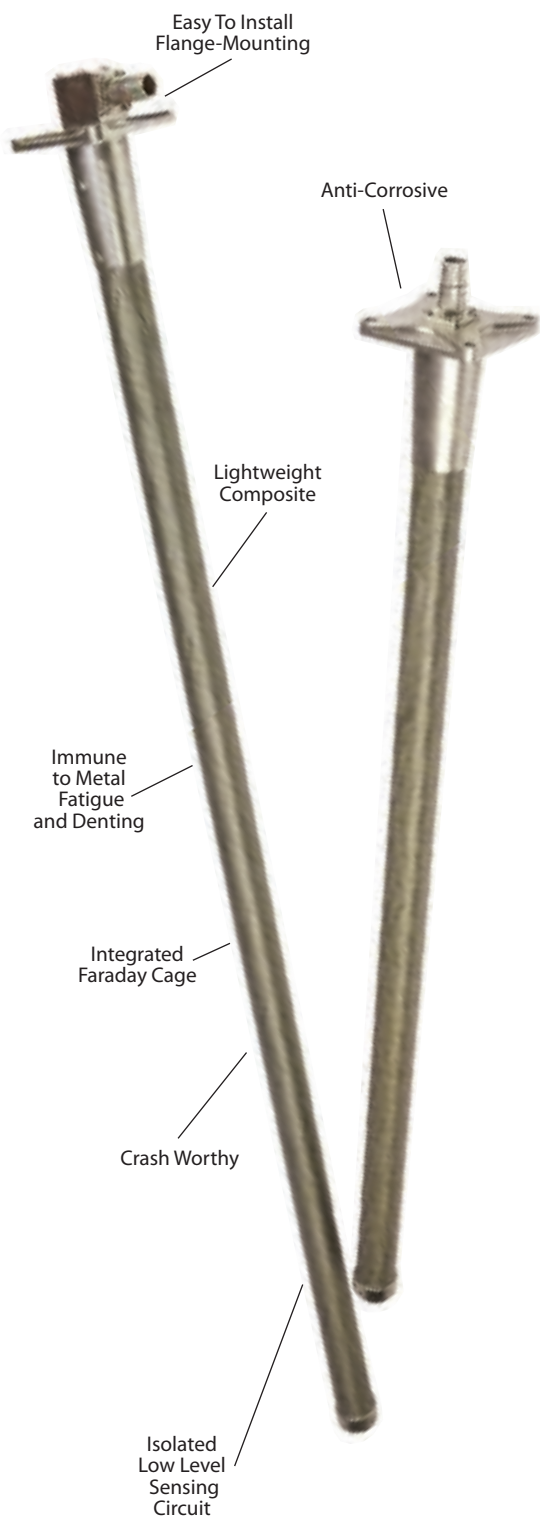
The LMS DC Fuel Probes are density compensated by measuring temperature and using a proprietary LMS design for correcting the variation of dielectric constant to fuel density.

## DC Fuel Probe Features

- Robust two composite tube design with EMI compatible outer tube
- Won't dent, scratch or absorb hand oils
- Low level capability
- Full density compensated probe
- No coaxial shielding (over-braid only)
- Lowest cabling complexity
- No outer tube shorts to ground
- More accurate pre-calibrated system
- No friction or riveted electrical connections
- No fatigue or cracking under high vibration or slosh loads
- Half the weight of three-tube aluminum EMI probes

# DC FUEL PROBES

WITH GROUNDED OUTER TUBE



# AC FUEL PROBES

MADE OF LIGHTWEIGHT GRAPHITE COMPOSITE

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LMS Composite Fuel Quantity Probes for AC Systems are made with lightweight and durable graphite composite. They are the lightest fuel probe available in the industry and virtually immune to corrosion, cracking, dents and extreme field conditions. In fact, LMS has delivered over 7,000 graphite composite fuel quantity probes to the field, operating with no field failures in a wide variety of both commercial and military aircraft.

## **Graphite Composite Construction**

An LMS Composite Fuel Probe weighs approximately half as much as a similar metal probe. For example, a 38" long LMS composite probe now in production (with cable) weighs less than 10 ounces.

## **Electrical Connections**

All electrical connections to the capacitance probe, from the interface connector to the actual probe tubes, make use of soldered or composite bonded electrical connections. There are no friction or riveted electrical connections on an LMS Composite Fuel Probe and all electrical terminations are sealed from the fuel environment.

## **Durability**

Fatigue cracking of aluminum fuel probes, although infrequent, does occur around flood holes or riveted connections, especially with a relatively long flange-mounted cantilevered unit. The LMS Composite Probe with graphite composite tubing is inherently resistant to fatigue because the material does not "work harden" as aluminum does. Since the composite tubes are roughly half the weight of aluminum and are generally stiffer, the resonance amplitudes are significantly less.

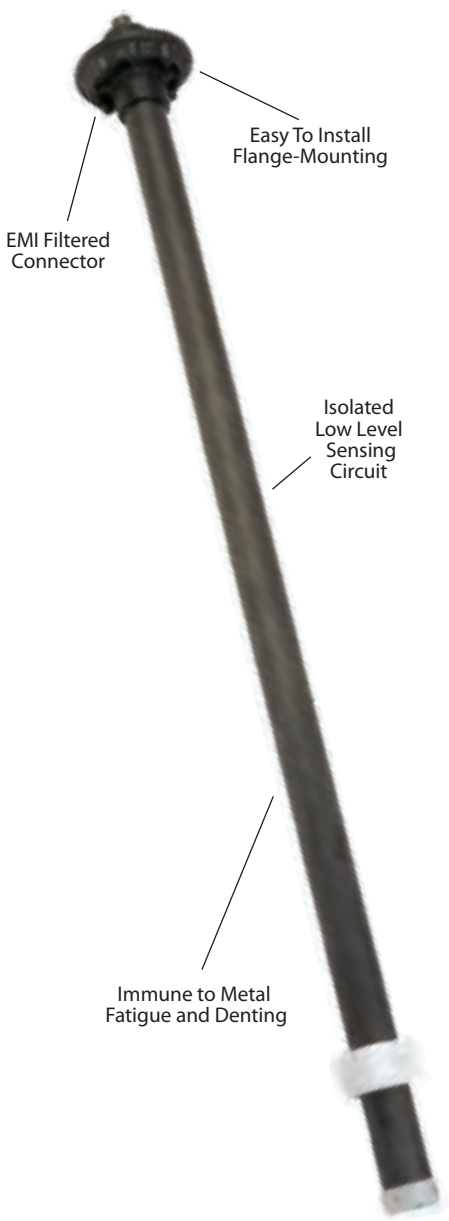
## **AC Fuel Probe Features**

- Robust composite two-tube design
- Won't dent, scratch or absorb hand oils
- Low level capability
- AC system is not susceptible to EMI
- No electrical components on probe
- No friction or cracking under high vibration or slosh loads
- Half the weight of aluminum probes

# AC FUEL PROBES

MADE OF LIGHTWEIGHT GRAPHITE COMPOSITE

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# INDICATORS

## SINGLE EMI PROTECTED MULTI-TANK DISPLAY (MTD)

The indicator shown below is a single EMI protected Multi-Tank Display (MTD). This indicator is night vision (NVG) compatible and sunlight readable. The MTD features a continuous display of up to 6 tanks plus total fuel. Other configurations are available.

### 2" Square Digital Indicator

The LED display of the square indicator utilizes four, 8 alphanumeric character, high-intensity LED displays. The mechanical enclosure divides the display into seven fields; six 3-digit fields for each of the individual fuel tanks, and an 8 character field for display of total fuel. The total fuel field is also used to post error conditions detected by or communicated to the MTD.



Alpha Numeric  
Display

Sunlight Readable

### Display Control

The display is designed to allow fuel weights of multiple tanks and total fuel weight on the aircraft to be displayed simultaneously. The display uses a standard display controller. Firmware communicates with the controller to show text on the display.

# INDICATORS

SINGLE EMI PROTECTED MULTI-TANK DISPLAY (MTD)

## 2" Round Digital Indicator

The 2" round digital indicator provides 8 alphanumeric characters that can be configured to display fuel quantities. Total fuel and additional tank quantities can be displayed by means of an external selector switch.

Sealed for Protection  
in Harsh Environments



NVG Compatible

## Built-In Test (BIT)

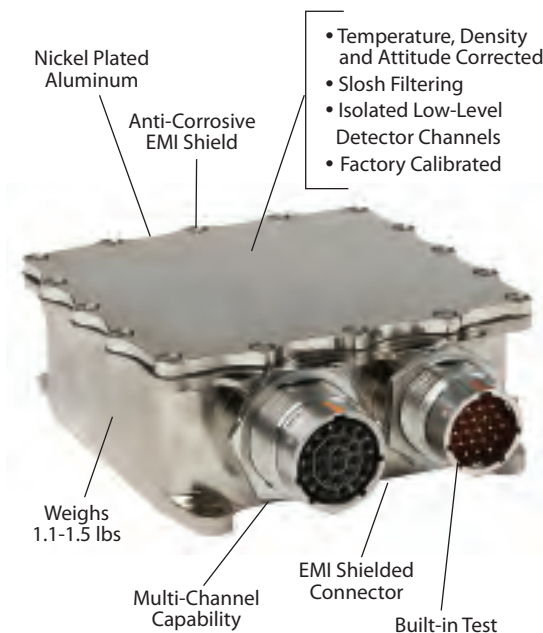
All BIT function is implemented in firmware, but requires supporting hardware for many of the tests it performs. Firmware is responsible for executing BIT and reporting errors appropriately. Continuous BIT (CBIT) tests are performed while the unit is running. Initiated BIT (IBIT) are executed in response to receiving an IBIT started message.

## Display Control

The display is designed to allow fuel weights of multiple tanks and total fuel weight on the aircraft to be displayed simultaneously. The display uses a standard display controller. Firmware communicates with the controller to show text on the display.

# DIGITAL AND ANALOG MULTI-CHANNEL SIGNAL CONDITIONERS

LMS Multi-Channel Signal Conditioners measure capacitance type fuel probes and provide output signal compatible with LMS indicators and/or a glass cockpit system. Each channel can compensate for tank profiles using look up tables. The units are housed in nickel plated aluminum enclosures and utilize EMI gaskets and EMI connectors. They are the lightest signal conditioners available in the industry. All units are shipped pre-calibrated and require no field adjustments. In addition to all this, the signal conditioners are equipped with independent Low Level Detection channels.





# DIGITAL AND ANALOG MULTI-CHANNEL SIGNAL CONDITIONERS

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## **Pump and Valve Control**

The signal conditioner is capable of managing multiple fuel tanks. During fueling and flight modes, pumps and valves can be controlled by discrete signals based on fuel level measured to enable proper flow and transfer of fuel.

## **Outputs**

Our Multi-Channel Signal Conditioners convert the probe capacitance signal. The data is then provided to the LMS digital indicator or Multi-Function display in the cockpit. The Signal Conditioner can transmit and receive data using a digital bus or provide an analog voltage output scaled to meet your specific requirements.

## **Optional Built-In Test (BIT)**

Firmware is responsible for executing BIT and reporting errors appropriately. Continuous BIT (CBIT) tests are performed while the unit is running. Initiated BIT (IBIT) are executed in response to receiving an IBIT started message.

## **Signal Conditioner Features**

- MIL-STD EMI Connectors
- Multi-Tank Measuring
- Digital or Analog Output
- Pre-calibrated for Easy Installation
- Low Level Detection Channels
- Nickel-Plated Aluminum Construction