PRINCETON CAPACITIVE FUEL LEVEL PROBES

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Advanced Flight Systems & Aerospace Logic
Capacitive Plate Adaptor Instructions

These instructions are for the Van's capacitive plate adaptor. Only empty needs to be calibrated on the adaptor.

Theory of operation

The probe senses a change in fuel level using a capacitive sensor formed by two metal conductors. No current passes through the fuel. The aluminum ribs are at ground potential. The plates on standoffs has a signal on it through a 1.5 Meg ohm resister. There is a digital microprocessor that filters and conditions the signal providing a very stable fuel level reading.

The leads from the probe are protected from miss wiring of the probe. The supply voltage can be from 10 to 28 volts continues. The plus power supply lead is protected to 70 VRMS and 48 volts DC for short durations.

Probe operation

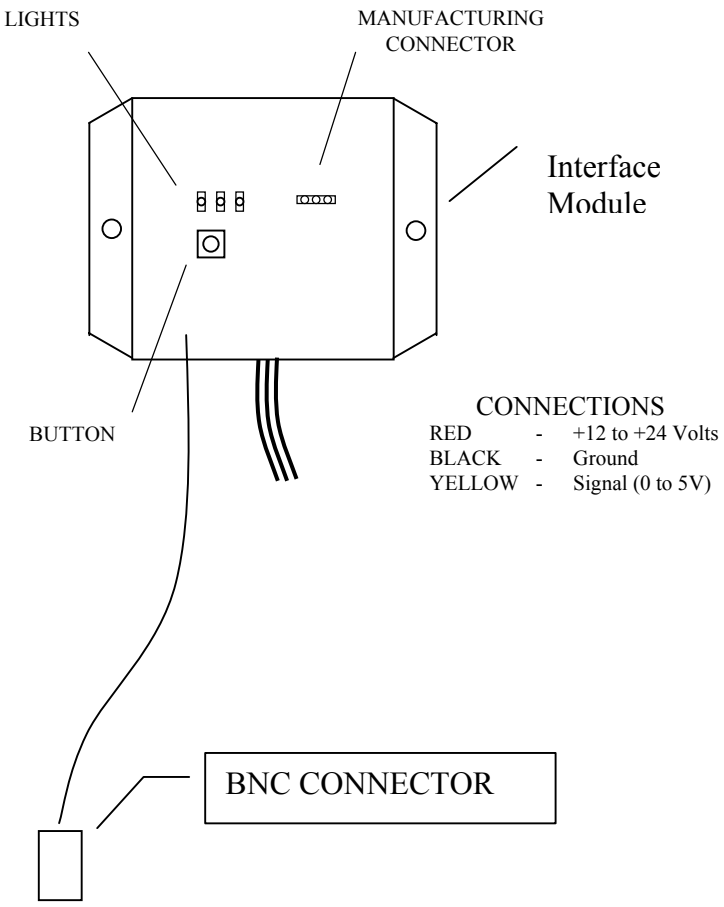
The probe has two modes of operation, calibration and run. The probe comes from the factory in calibration mode. To calibrate the probe see the calibration instructions.

When power is applied and the probe has been calibrated the probe will perform a self-test sequence. The middle light flashes quickly while this process takes place. The output of the probe will go to full for 1 second and then empty for 1 second. This allows a visual test of both the gauge and the probe for proper operation. The output is filtered with a RC network and therefore does not change rapidly. The output will read full very briefly. After the self-test a heartbeat will flash every 2 seconds on the middle light. The current level is updated without averaging to get a reading quickly at power-up.

The output of the probe is digitally filtered by two methods. The first is an averaging function. Readings are averaged for 10 seconds before being passed to the second digital filter. This type of filtering works well with fuel because of low frequency sloshing. With float type probes this is seen in the indicator rocking back and fourth. The averaging method eliminates this.

The second digital filter is a low pass filter that behaves like a RC filter with a long time constant. The output will change slowly. The main benefit from this filter is the elimination of high frequency oscillations.

Because of the filtering used the fuel level reading will be very stable. It can take up to **20 seconds to update** an actual change in fuel quantity.



DO NOT CUT THE SHIELDED CABLE!

Cunsult the factory before modifying the RG316 coax cable. The shield is not at ground potentiol. The shield does not connect to the BNC.

NOTE: These adaptors will not work with fuels that contain alcohol.

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General Calibration Information

- The probe can be recalibrated an unlimited number of times.
- The only calibration sequence required is **empty**.
- Calibration can be entered or restarted at any time.
- To enter calibration mode, hold the button down while turning on the power.
- The empty set point can take as long as 16 seconds.
- Water affects the probe giving a reading of full. Water will not hurt the probe. The surface tension of water will make it hard to be removed from the probe. Gently tapping the probe will help.

Calibration for Capacitive Plate Adaptor

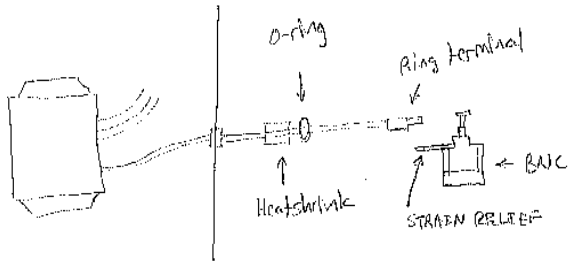
- Hold down the button while turning the power on. (If the left light is not already flashing.)
- Both outer lights will be on and the center light will be flashing while the button is held.
- Release the button. The left light will be flashing. Indicating **Empty** set point.
- Place the amount of fuel you want to read **Empty** in the tank.
- Press the button. The left light will stay on (stop flashing) while the initial calibration is performed. This can take as long as 16 seconds. The rest of the set points will take less than 2 seconds.
- The probe is now calibrated. You can now calibrate the ACS2002.

◉ Flashing	○ Off
◉○○	EMPTY SET POINT

Table 1 Set point modes

● ON	○ OFF
●○● / ○●○	DATA ERROR
●●● / ○○○	UNABLE TO CAL
●●○ / ○○●	UNSTABLE

Table 2 Error codes



Error Codes

- **DATA ERROR** – The data stored in eeprom is not valid. Action to take: Recalibrate. If the error persists contact technical support.
- **CALIBRATION ERROR** – This error can only happen during empty set point calibration. It indicates that the probe could not be calibrated. Most likely cause is contact between the copper and aluminum tubes from shortening. The presence of water or alcohol in the probe would act the same as a short. Action to take: Check for any contact between the rods, remove any water, and recalibrate. Use fuel without alcohol.
- **UNSTABLE** - This error can only happen during empty set point calibration. It indicates that the fuel level was not stable or the presence of alcohol. Action to take: Recalibrate while insuring that the level of the fuel is not changing during calibration and the fuel does not contain alcohol.

Limited Lifetime Warranty

Princeton Electronics, Inc. will repair or replace any probe found to have a manufacture defect. Probes that have been shortened, or the leads cut cannot be exchanged or returned for credit unless they are found to have a manufacturer defect.

VER1.01

Disclaimer

This fuel probe is for reference only, the operator is responsible to visually inspect fuel quantities prior to use. Relying solely on a fuel gage could result in unexpected engine stoppage.

Because Princeton Electronics, Inc. does not install the fuel monitoring system; we rely solely on the installer to insure proper installation.