



## Programmable Fuel Level Senders – 2 Terminal Model# PFLS all lengths

### **Overview**

Livorsi Marine's new microcontroller-based senders can be distinguished from our older analog style by a "P" in the part number ex: PFLS, and no trim/adjust potentiometers on the top of the sender. Senders with aluminum tubing are for oil, diesel, or gasoline of up to 10% ethanol; and senders with PVC tubing are for potable water. We do not offer units for non-potable water, which leaves conductive deposits on the sense wire.

### **How The Senders Measure Liquid**

Livorsi Marine senders work by measuring capacitance. This means that no moving parts are required. Electronics in the head convert the measured capacitance to the programmed output of ohms or volts. In fuel senders, capacitance is measured between the inner-sensing tube and the grounded outer tube, and it requires the fluid to be non-conductive. In water senders, capacitance is measured between the inner insulated sense wire and the water, which is grounded by the outer wire.

### **Shortening Senders** (if required)

A fuel sender's outer tube can be shortened using a tubing cutter and the inner tube snipped. Unless the sender was ordered as bendable, bending the tubing risks shorting the inner to outer tube which causes a false Empty reading. A sender ordered as bendable can be safely bent above the black bend line on the tubing because it is insulated internally above that line.

### **Connections**

**NEG:** connect this to DC ground. **NOTE:** our senders work with negative-ground systems only

**SEND:** connect this to the sender input of your gauge or display. **NOTE:** this is an electronic output which will confuse your ohmmeter if you try to take a resistance reading.

### **Calibration**

Output range and alarm levels are not changeable by the customer. The output range (ex: 240/33 ohms) and alarm levels (if ordered) are set at the factory per the customer's order. They cannot be changed by the end user. They can be changed back at the factory if needed.

### **Factory Calibrations**

If you did not need to shorten the sender, the factory Empty and Full settings should be correct. Please contact us for advice if they seem wrong, rather than recalibrating.

## **Calibration For Shortened Senders**


Follow the recalibration steps below

### **Calibration By Jumpering at Powerup**

The programmable senders are calibrated by a jumpering scheme at powerup, rather than by potentiometers.

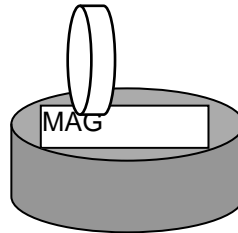
For senders with 2 terminals, wires or connectors- the jumpering is done by a magnet. If you have one of these senders but a magnet was not included, you need a “rare earth” (strong) magnet, such as a Radio Shack 64-1895.

### **Setting Empty**

1. Have the sender out of the tank and wired normally to the gauge, with the ignition switch **OFF**.
2. Have the magnet applied. 
3. Turn the ignition switch **ON** and count for two seconds- ex: “1000-1, 1000-2” then remove the magnet.

Depending on how quick your gauge’s response is, the needle may do some bouncing. It will end on an EMPTY reading.


Hold the magnet vertically against the surface of the sender on the word **MAG** as shown in the diagram. This will best align the magnet field with the internal magnetic switch.



### **Setting Full**

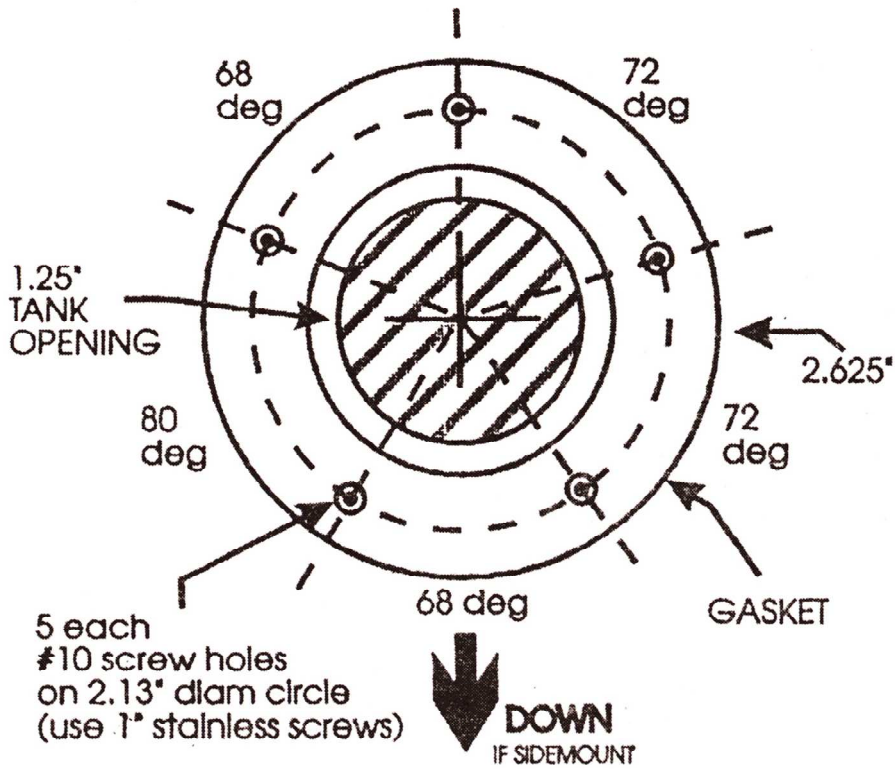
FULL is set automatically by the Full Detection sensor at powerup each time the tank has been filled. This is useful because it corrects for “dielectric constant” differences between tank-fulls of fuel. Full does not need to be set manually. Manually setting Full disables the Full Detection sensor.

But if for some reason you find you need a non-automatic Full, here’s how to calibrate:

1. Have sender in a full tank of fuel and wired normally to the gauge, with the ignition switch **OFF**.
2. Have the magnet applied. 
3. Turn the ignition switch **ON** and count for 5 seconds  
ex: “1000-1, 1000-2, 1000-3, 1000-4, 1000-5”, then remove the magnet.

Depending on how quick your gauge’s response is the needle may do some bouncing. It will end on a Full reading.

MOUNTING DIAGRAM  
 STANDARD 5-HOLE BOLT PATTERN  
 ACTUAL SIZE IF CIRCLE MEASURES 2 5/8"



ref 1

2 Terminal

