



11 INDUSTRY DRIVE  
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# Programmable Fuel Sender INSTALLATION and CALIBRATION

## 1. 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 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.

## 2. CONNECTIONS

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

SEND: connect this to the Send 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. Instead we troubleshoot by voltages, while connected to the gauge.

POS (most senders): Most Hardin senders have an ignition-voltage POS terminal to run their electronics. A fused voltage between 11-28 vdc should be wired to the POS connection. The voltage should turn off when the system is turned off, both for safety and to avoid running down the battery. For a number of brands of 240/33 ohm gauges (not all), we can make a special sender that doesn't have this POS connection. These senders run their electronics from voltage on the Send connection.

## 3. CALIBRATION

### A. OUTPUT RANGE AND ALARM LEVELS ARE FIXED

The output range (eg 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, however.

### B. EMPTY LEVEL ON SENDERS WITH THREE OR FOUR SCREW TERMINALS

The Empty level will already be calibrated to be the bottom of the sender if you use the sender at its factory length. If you've shortened the sender, the Empty should be recalibrated with the following steps. The timing is important. 1) have the sender out of tank and wired normally, but power off; 2) have SEND temporarily jumpered to NEG; 3) turn the power on, but remove the SEND/NEG jumper after TWO SECONDS (one-thousand one, one-thousand two). The needle will then do some bouncing between Empty and Full and finish on Empty. If it finishes somewhere other than E or lower, there is a wiring problem or mismatched output range. Please email or fax for help.

### C. FULL LEVEL ON SENDERS WITH THREE OR FOUR SCREW TERMINALS

For fuel senders with "-FD" in the part number, the Full level is automatically detected by a special sensor each time you fill the tank. So the Full level does not have to be set manually. If you'd prefer to set it manually, follow the underlined steps in the previous paragraph, using the appropriate fuel rather than water. The automatic mode helps the sender respond correctly to gasoline with ethanol or biodiesel, however.

Full will be calibrated at the factory a couple inches below the senders head. If you've shortened the sender, or prefer a different Full height, the Full can be recalibrated with the following steps: 1) have sender in full tank (or tube) of the appropriate liquid, and wired normally, but with the power off; 2) have SEND temporarily jumpered to NEG; 3) turn the power on, but remove the SEND/NEG jumper after FOUR SECONDS (one-thousand one, one-thousand two, one-thousand three, one-thousand four). The needle will then do some bouncing between Empty and Full and finish on FULL. If it finishes somewhere other than F or higher, there is a wiring problem or mismatched output range.

### D. SENDERS WITH TWO SCREW TERMINALS, AND SENDERS WITH WIRES OR CONNECTORS

A rare-earth magnet (provided with the sender, or use Radio Shack 64-1895) is used to set Empty and/or Full on senders with two terminals, or with wires or connectors. The word MAG with an arrow will be found on the label. Instead of shorting terminals in steps 3B and 3C, place the magnet above the MAG arrow for the seconds listed. That will internally cause the desired short.