



**CENTROID
PRODUCTS**

Mastercraft/Moeller Fuel Sender Help

www.CentroidProducts.com/mc.pdf
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ORDERS ONLY: 386-423-3574 TECH SUPPORT: help@centroidproducts.com or fax: 386-423-3709 website: centroidproducts.com

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1. HELP

We are a small company. We provide tech support from Joel, the engineer, by email only, at help@centroidproducts.com. You'll get email help the same day. We test all replacement senders before we ship them, so if one seems bad, you'll want to email me. It won't be a bad sender.

2. HISTORY

Centroid senders have heads like hockey pucks. Our senders designed for fuel have aluminum tubing, and senders designed for water have PVC tubing.

Between 1998 and late 1999, we supplied 2-wire senders to Mastercraft to drive their VDO and Teleflex needle gauges.

Then between 2000 and 2006 we supplied 3-terminal senders for the Medallion/BorgWarner "MDC" computerized gauges. MDC displays can be recognized by the motorized grinding at powerup as the gauges initialize. There were two versions of the MDC display, with the early version (?2000-2001?) requiring our sender to put out lower ohms to get to Full than the later version did.

Mastercraft's tank manufacturer is Moeller Marine. If Moeller bought and installed our senders for Mastercraft, they will have Moeller part numbers on the labels, which are in the form 395xxx. If Mastercraft bought the senders directly, they will have Mastercraft part numbers on the labels, which are in the form 153xxx.

3. SENDER SCIENCE

Centroid **fuel** senders work by measuring capacitance between their inner and outer tubes, and cannot be tested in water. Centroid **water** senders measure the capacitance between the grounded water and their insulated inner sense wire.

The output resistance of Centroid senders cannot be measured with an ohmmeter like a float sender's can, due to the electronic nature of our sender's output. Instead, we troubleshoot by voltages.

The capacitance of gasoline unfortunately depends on the percentage of ethanol in it. On the original equipment senders with Empty and Full potentiometers, this required readjusting the Full adjustment to put the needle on the Full mark with a full tank, to match the percent ethanol in a customer's area of the country. The programmable replacement senders we ship these days have a Full Detection scheme for readjusting the Full scaling automatically at each fillup.

4. POSSIBLE 2-WIRE PROBLEMS

A. POLARITY

The most common problem on 2-wire installations is polarity. On the senders, the pink wire is Send and the black wire is Neg. If you plug the sender in half way to the harness connector, so you can measure the connected voltages, and if you put the black lead of your voltmeter on sender black, and put the red lead of your voltmeter on sender pink, you should get a *positive* voltage reading of a couple of volts (no minus sign). If you get a negative voltage, which would result in a constant F++ reading, you need to reverse the wires of either the sender or harness.

B. FULL DETECTION

If you are working with a programmable replacement sender (no potentiometers), the reading may be somewhat low after installation until the first fillup allows the sender to recalibrate its Full calibration.

5. POSSIBLE 3-WIRE PROBLEMS

A. GROUND OFFSET

if a sender reads above Empty even with the sender out of fuel, there's a known Mastercraft ground offset problem that requires jumpering the MDC display's ground to a ground bus near the display. I can provide details by email.

B. CPMDC VERSUS "OLD" CPMDC

As mentioned in section 2, the oldest MDC displays required different ohms than the newer ones. To check whether your display is "old style", unplug the sender, and then check the voltage between the harness wire that would be connected to sender black, and the harness wire that would be connected to sender white. If you get about 7 volts with power on, that's new style, whereas if you get about 12 volts, that's old style. We ship replacement senders programmed as new-style, but can reprogram a sender to old-style if you'll send it to Centroid Products, 2104 Hibiscus Dr, Edgewater FL 32141 with the note "please change to OLD CPMDC".

C. OUTPUT

In addition to CPMDC and OLD CPMDC, some of our 3-wire senders for Mastercraft senders have a 0 to 5 volt output. So don't assume that because a replacement sender is the right length, it will work even when it doesn't match the original part number. Nothing's easy.

D. FULL DETECTION

See 4B.