Maretron’s FFM100 provides precision fuel flow information to help optimize fuel consumption, which can save thousands of dollars in fuel operating cost. The FFM100 uses state-of-the-art, positive displacement metering technology for unprecedented accuracy. In fact, the accuracy of the FFM100 is nearly that of commercial vessel systems costing tens of thousands of dollars, yet the FFM100 costs less than existing recreational systems found on the market today. Additional benefits of the positive displacement metering technology are the elimination of flow conditioning components such as straighteners and pulsation dampers. Other flow meter technologies require flow conditioning components that increase system and installation cost. The FFM100 also uses true temperature compensation with embedded temperature sensors within the meters. The returning fuel is generally hotter than the supply fuel and if not properly compensated, inaccuracies as much as 5% can occur in computing the engine’s fuel consumption. The FFM100 also detects momentary reverse flow in the fuel lines due to fluctuating pressure caused by the injection pump. Less accurate systems count the reverse fuel flow as part of the consumed fuel where the FFM100 properly accounts for momentary reverse flow. Lastly, the FFM100 can be used for fluid types other than fuel (e.g., water, oil, etc.) by ordering the appropriate flow sender.

**Products**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFM100-01</td>
<td>Fuel Flow Monitor</td>
</tr>
<tr>
<td>M1AR</td>
<td>Fuel Flow Sensor 2-100 LPH (0.53-26.4 GPH)</td>
</tr>
<tr>
<td>M2AR</td>
<td>Fuel Flow Sensor 25-500 LPH (6.6-132 GPH)</td>
</tr>
<tr>
<td>M4AR</td>
<td>Fuel Flow Sensor 180-1500 LPH (48-396 GPH)</td>
</tr>
<tr>
<td>M8AR</td>
<td>Fuel Flow Sensor 8-70 LPM (2.1-18.5 GPM)</td>
</tr>
<tr>
<td>M16AR</td>
<td>Fuel Flow Sensor 10-100 LPM (2.6-26.4 GPM)</td>
</tr>
</tbody>
</table>

The following accessories are available for the FFM100:

- FFM100 converts a variety of flow senders (e.g., fuel, water, etc.) to NMEA 2000® Network Data
- All flow senders ordered separately depending on application (i.e., single fuel flow sender for gas engine, dual fuel flow senders for diesel engine, water flow sender for sea water, etc.)
- Fuel flow senders to facilitate fuel consumption optimization for reduced fuel operating cost
- Fuel flow senders use positive displacement metering technology for superior accuracy over other measurement technology such as turbine meters
- Fuel flow senders do not require costly fuel conditioning components like flow straighteners and pulse dampers
- Fuel flow senders implement true temperature compensation with precision built-in thermistors for increased accuracy
- Fuel flow senders automatically detect reverse flow due to fluctuating pressure difference from injection pumps
- Fuel flow senders pass particle sizes up to 70 micrometers (diesel fuel filters normally filter down to 2 micrometers to prevent clogging injectors)
Environmental Mechanical Electrical NMEA 2000® Parameter Group Numbers (PGNs)

Certifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Voltage</td>
<td>9 to 32 Volts DC Voltage</td>
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</tr>
<tr>
<td>Power Consumption</td>
<td>150mA Maximum Current Drain</td>
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</tr>
<tr>
<td>Load Equivalence Number (LEN)</td>
<td>3 NMEA 2000® Spec. (1LEN = 50mA)</td>
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<tr>
<td>Reverse Battery Protection</td>
<td>Yes Indefinitely</td>
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</tr>
<tr>
<td>Load Dump Protection</td>
<td>Yes Energy Rated per SAE J1113</td>
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</tr>
<tr>
<td>Size</td>
<td>3.50” x 4.20” x 2.03” (88.9mm x 106.7mm x 51.6mm) Including Flanges for Mounting</td>
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</tr>
<tr>
<td>Weight</td>
<td>13 oz. (368.5 g)</td>
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</tr>
<tr>
<td>IEC 60945 Classification</td>
<td>Exposed</td>
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<tr>
<td>Degree of Protection</td>
<td>IP64</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25°C to 55°C</td>
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</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C to 70°C</td>
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</tr>
<tr>
<td>Relative Humidity</td>
<td>93%RH @40°C per IEC60945-8.2</td>
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</tr>
<tr>
<td>Vibration</td>
<td>2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7</td>
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</tr>
<tr>
<td>Solar Radiation</td>
<td>Ultraviolet B, A, Visible, and Infrared per IEC 60945-8.10</td>
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</tr>
<tr>
<td>Corrosion (Salt Mist)</td>
<td>4 times 7 days @ 40°C, 95%RH after 2 hour Salt Spray Per IEC 60945-8.12</td>
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<tr>
<td>Electromagnetic Emission</td>
<td>Conducted and Radiated Emission per IEC 60945-9</td>
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<tr>
<td>Electromagnetic Immunity</td>
<td>Conducted, Radiated, Supply, and ESD per IEC 60945-10</td>
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<tr>
<td>Safety Precautions</td>
<td>Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12</td>
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Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>DS150 &amp; DS250 Screen Shots</td>
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</table>

Parameter Group Number Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>PGN #</th>
<th>PGN Name</th>
<th>Default Rate</th>
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<tbody>
<tr>
<td>Periodic Data PGNs</td>
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<tr>
<td>065286</td>
<td>Fluid Flow Rate (Maretron Proprietary)</td>
<td>2 Times/Second</td>
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<tr>
<td>065287</td>
<td>Trip Volume (Maretron Proprietary)</td>
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<tr>
<td>127489</td>
<td>Engine Parameters, Dynamic</td>
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<tr>
<td>127497</td>
<td>Trip Parameters, Engine</td>
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<tr>
<td>130312</td>
<td>Temperature</td>
<td>0.5 Times/Second</td>
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<tr>
<td>130316</td>
<td>Temperature, Extended Range</td>
<td>0.5 Times/Second</td>
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<tr>
<td>Response to Requested PGNs</td>
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<tr>
<td>126464</td>
<td>PGN List (Transmit and Receive)</td>
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<tr>
<td>126996</td>
<td>Product Information</td>
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<td>126998</td>
<td>Configuration Information</td>
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<tr>
<td>059392</td>
<td>ISO Acknowledge</td>
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<tr>
<td>059904</td>
<td>ISO Request</td>
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<td>Protocol PGNs</td>
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<td>065240</td>
<td>ISO Address Command</td>
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<td>126208</td>
<td>NMEA</td>
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<tr>
<td>Maretron Proprietary PGNs</td>
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<tr>
<td>128720</td>
<td>Configuration</td>
<td>N/A</td>
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