Does Maretron offer quick setup instructions for the FFM100 in a single diesel engine application?

The prerequisite for using this guide requires the use of a Windows PC and Maretron's N2KAnalyzer program installed. The hardware required for Maretron device configuration is the USB100 or IPG100 Gateway connected to a powered N2K network with a FFM100 installed. Please note the DSM150/250 can provide the same configuration options as well, but only if the display is running firmware version 1.5.22 or higher.

Before you begin: Know the K-factor for each sensor installed. K-factors are located on the sensors label. as shown in Image#0

Prior to the following configuration guide you must connect the Maretron Fluid Flow Sensors to the appropriate channels as shown in image #1 below.

For additional wiring details refer to section 2.5 of the FFM100 User's Manual linked here: https://www.maretron.com/support/manuals/FFM100UM_1.3.pdf

The FFM100 can be configured as "two independent sensor" operating mode. You will need to do so in order to examine the engines individual flow rates that are consistent with the Manufacturer's published engines specification.

Manual configuration steps:

Open a FFM100 configuration dialog within the N2KAnalyzer tool. shown in Image#2

1. Change the operating mode of the FFM100 to “Two Independent Sensors”
2. Input K-factor for channel #0
3. Assign instancing to channel #0
4. Input K-factor channel #1
5. Assign instancing to channel #1
6. "Put Config to device"
7. "Close" Dialog

To skip the described manual setup: Scroll down to attachment section of this

article, a FFM100 configuration file is available for download and can be loaded into the FFM100 installed on a vessel. The file once loaded can help analyze engine fluid flow information and help you skip the configuration steps listed above.

Set up your DSM250 or N2KAnalyzer DSM250 to display two independent Fluid Flow Rates for fluid supply and return. You can also setup the favorite screen to display fluid temperatures for each sensor. This step can help you determine the conditions of fluid flow measurement such as if the sensors are properly wired to the correct channels. Example shown in the favorite screen setup within Image#3

Note: you can use the N2KAnalyzer "Transmitted PGN" window if you want to skip the DSM150/250 favorite screen setup to review FFM100 transmitted data over the N2K network. Details of this N2KAnalyzer feature can be found in section 4.10.1 linked here:
https://www.maretron.com/support/manuals/N2KAnalyzer_UM_2.1.6.pdf

Now that setup is complete examine data available from the FFM100 ie. fluid flow input and flow output during engine running operation.

Note:

- Both flow rates should be positive numbers.

- There should be more flow supply(Channel#0) than Flow return(Channel #1).

If you notice a negative flow rate: examine installation, specifically the orientation of fluid flow arrow located on the sensor lid. Remedy: configure the FFM100, select “Advanced” tab, select the sensor channel to change from Normal Installation to Reverse Installation. Details located in Section #3 of the FFM100 User’s Manual and shown in image#4

1. Make appropriate changes to correct the flow orientation vs the sensor orientation.
2. "Put Config to Device" command
3. "Close" Dialog

Once you are satisfied with observed fluid flow readings. Change the FFM100 operating mode back to “Differential” mode.

1. Change the "Operating Mode: Differential"
2. "Put Config to Device" command
3. "Close" Dialog

Symptoms of erroneous fluid flow readings such as negative flow rates, more fuel returning to tank than sourced.

1. Check for Air in return fuel line: If air is used to cool fluid flow through the measured line this will cause a higher than expected fluid flow rate and adversely affect fuel burn.
2. Check that the Sensor wiring: Sensors wires are color coded and have a specific terminal designation. The sensor wiring template can be found in the FFM100 User’s Manual, Sensors Installation Instructions, and

under the FFM100 module cover. If cable extensions have been made color codes can possibly change depending on the cable extension that has been incorporated into the installation.

Erratic fluid flow rate values:

1. Fluid flow sensor selected is too large for the flow range of your engine causing the displacement gears to fluctuate.
2. Fluid Flow sensor sputtering due to restrictions in the fuel line such as fuel filter restriction, fuel line residue build up, or pressure drop exceeds the engine manufacturers specification.

Running FFM100 version 1.2.2.1:

Pre-requisites: N2KAnalyzer 2.1.21.3

The latest version of the FFM100 firmware in conjunction with N2KAnalyzer offers a diagnostic real-time reading in both operating modes, see screen shots of the new dialog below. The new FFM100 dialog helps the technician determine the fluid flow for each sensor along with temperature diagnostics. This can be helpful when determining issues with installation.

Most common issues can range from the following application faults:

- Inadequate filtration causing poor sensor performance

- Sensor damage due to debris clogging or damaging sensor internals.

- Fluid pass through(no readings from sensor engine running)

- Sensor wiring issues

- Sensor installation reversed(wiring or physical)