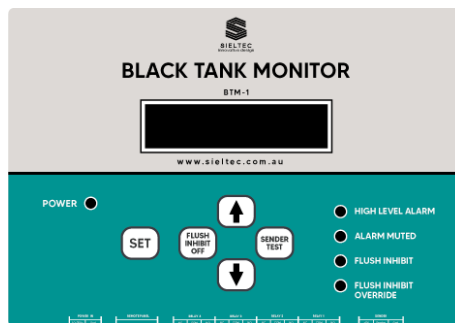




SIELTEC
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BTM-1 Black Tank Monitor

Technical Advice Note 070323

Wima 240-33 ohm resistive sender
coupled to a Garmin GFL 10 fluid level
adapter.

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Statement of Appreciation

Thank you for purchasing this BTM-1 from Sieltec. We understand that with this purchase comes a responsibility for Sieltec to ensure the product is fit for purpose and provides many years of trouble free service. If you are not satisfied with this product please contact Sieltec support and we will do all we can to rectify any problem relating to this product.

BTM-1 Technical Advice Note

Introduction

Example of specific Installation parameters

The BTM-1 has many variables to allow it to operate in various marine environments with various types of components being used.

This note provides advice regarding the use of a Wima 240-33 ohm resistive sender coupled to a Garmin GFL-1- fluid level adapter. The GFL-10 can be used to convert the resistive sender reading to the NMEA2000 backbone to be read by multi functional devices on the network.

The GFL-10 can be used to “sniff” across the voltage developed by an analogue gauge or it can provide the current through the sender resistor if an analogue gauge is not installed.

Either way the BTM-1 can sense the voltage on the sender and operate correctly.

Configuration

System setup

The system has a Garmin GFL-10 fluid sender to NMEA2000 interface. No analogue gauges are present. When no analogue gauges are present the GFL-10 provides the voltage to the sender.

The sender and ground connections on the BTM-1 are to be connected to the connections on the table from the GFL10 manual below for the resistive sensor.

U

| Connection Type | Wire Color | Gauge or Sensor Terminal |
|-------------------------|------------|-------------------------------|
| Analog Gauge | Blue | Sensor (S, G) |
| | White | Gauge power (+, +12V, I, IGN) |
| | Yellow | Unused |
| | Black | Ground (-, \perp , G) |
| | Red | Unused |
| Resistive Sensor | Blue | Sensor (S, G) |
| | White | Unused |
| | Yellow | Unused |
| | Black | Ground (-, \perp , G) |
| | Red | Unused |

If the system has an analogue gauge the analogue gauge provides the voltage for the sender. In the absence of an analogue gauge the GFL-10 provides a maximum of 5 volts to the sender via an approximately 390 ohm resistor. The resistance value is deduced from the following.

Remembering the readings are inverted as this is a USA convention sender.

Reading when empty = 630

Reading when full = 945

Voltage equivalent for empty $630/1023 \times 5$ volts = 3.08 volts

Voltage equivalent for full $945/1023 \times 5$ volts = 4.62 volts

Because of the level inversion for the USA standard.

Actual voltage for empty = $5 - 3.08 = 1.92$ volts

Actual voltage for full = $5 - 4.62 = 0.38$ volts

Sieltec Innovative design
Black Tank Monitoring Concept Only
Wima 240-33, Garmin GFL10

The Wima Sender is USA standard
- Low R for full. High R for empty.
33 ohms for full. 240 ohms for empty.

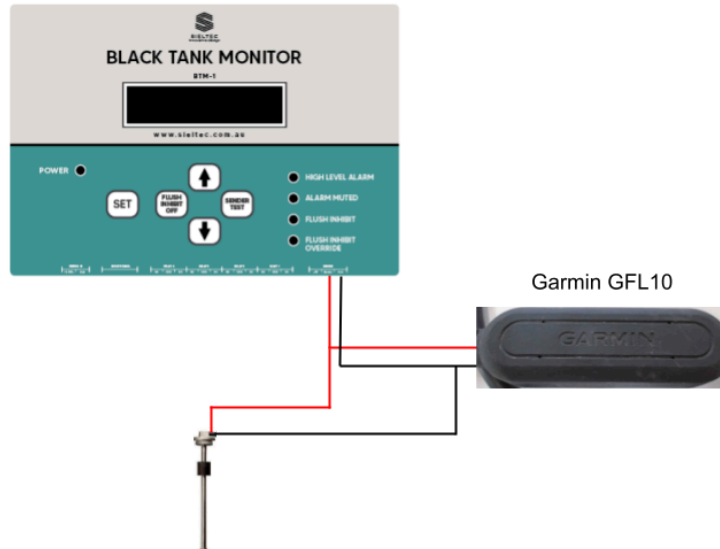
BTM-1 must be set for USA standard. Power on with any button pushed.
Full setting reads 945 on sender test
Empty setting reads 630 on sender test
Range = 315

Lowest voltage on sender
5 - (945/1023 x 5) = 0.38 volts (Full)
Highest voltage on sender
5 - (630/1023 x 5) = 1.92 volts (Empty)

Level 1 set to 80%
80% x range + zero reading
80% x 315 + 630 = 882

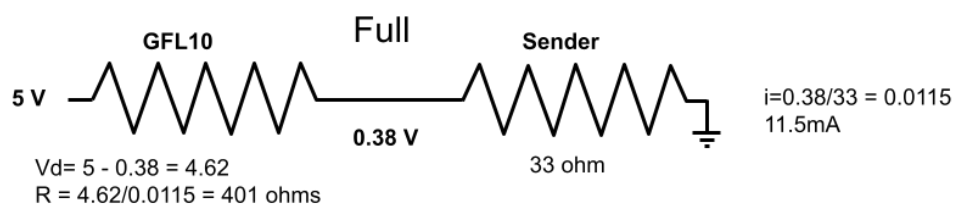
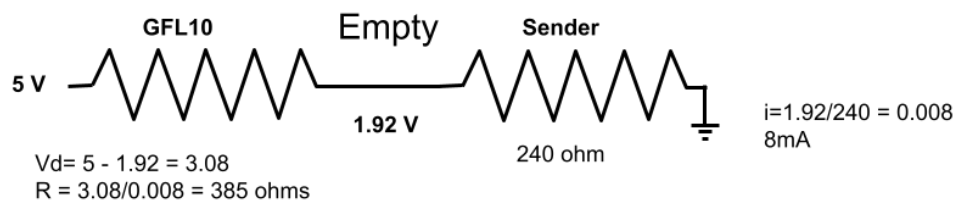
Level 2 set to 90%
90% x range + zero reading
90% x 315 + 630 = 913

Set Level 1 to 882 and Level 2 to 913



The equivalent circuit follows

Equivalent circuit diagram



This shows the equivalent series resistance from the GFL10 is about 390 ohms.

