

GAS SENSOR CONDITIONER INSTALLATION MANUAL



INTRODUCTION

This document serves as the instruction or procedure to install the IRQ-101A gas sensor signal conditioner. The IRQ-101A is very simple to install if you have direct access to the fuel sender signal from the tank.

Car gas levels are measured via a fuel sending unit or fuel sensor. There are different types of sending units (fuel sensors) in the market. The most common are a float device attached to a variable resistance or a capacitive reading sensor that measures the capacitance across its plates when submerged in gas.

The floating device is the common sensor found on regular cars due to its lower cost. Different cars use different resistive values to indicate from Full to Empty. The sensors are built in such a way that not only the movement of the gas affects the reading, but also the contact surface between the wiper and resistance disconnects due to car vibration, sensor age, etc.

A capacitive fuel sender can be used as a replacement for the float sender. There is some added cost to add the capacitive sender into an existing gas tank. This type of sender is less affected by the gas moving to a lower degree but it still needs to be filtered.

FUEL SENDER

An example of a resistive type of gas sender is shown in Figure 1. The sensor works with a float attached to an arm that swivels about a pivot point, moving wiper metal across a resistance. The amount of gas makes the float move the arm, varying the ohms used to define the gas level. In other words, the fuel sender mimics a potentiometer (variable resistance) attached to an arm that moves based on how much gas there is in a tank.



Figure 1: Fuel Sender example

A typical car fuel sender circuit has two signals coming from the tank. One signal is ground or chassis, which is connected to the battery negative terminal or chassis. The second wire is the fuel sender signal.

IRQ-101A INSTALLATION

There are a total of 4 wires connections available from the IRQ-101A.

- Bundled Cable:
 - RED - 12Vdc from Battery
 - BLACK - Ground from Battery
 - WHITE - IRQ-101A Output signal (0-5Vdc)
- FUEL SENDER
 - BLACK - Fuel Sender Input to IRQ-101A.

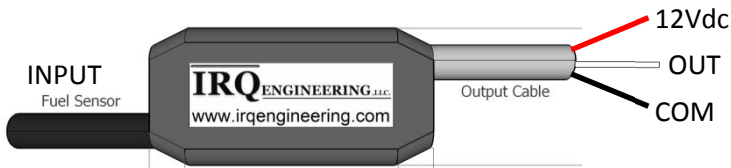


Figure 2: IRQ-101A Pin-out

The following are the connection to the output wires bundled together:

- Connect power from the battery +12V to the **RED** 26AWG wire.
- The battery negative terminal or chassis must be connected to the **BLACK** 26AWG wire.
- The **WHITE** wire is directly connected to the digital acquisition system (DAS).

The single (18AWG) **BLACK** wire at the other end of the IRQ-101A connects to the fuel SENDER signal:

- Connect the single black wire to the fuel sender signal.
- If SENDER has ground pin connect it to the chassis (refer to SENDER manual).

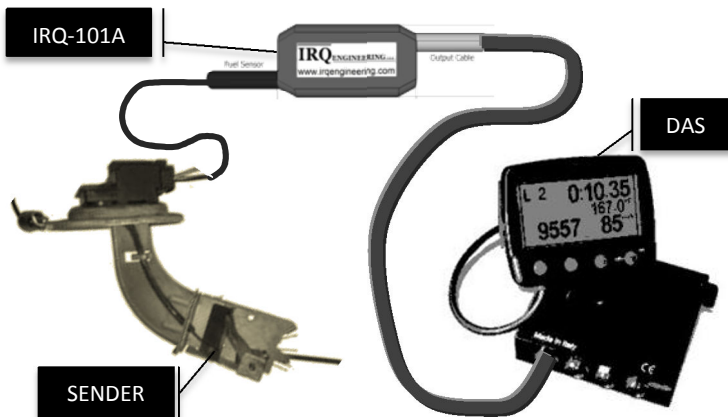


Figure 3: Final connection including IRQ-101A in line

CALIBRATION PROCEDURE

In order to understand the calibration procedure one has to keep in mind how the IRQ-101A works. The unit filters out any sudden variances in gas based on realistic gas level consumptions.

Once installed in your car, the IRQ-101A needs to be calibrated. The calibration procedure involves having to empty out the tank completely and correlating voltage outputs from the unit as gas is poured into the tank. The DAS represents the gas level based on a curve of voltages levels to amount of gas recorded to display the current gas level based on that curve.

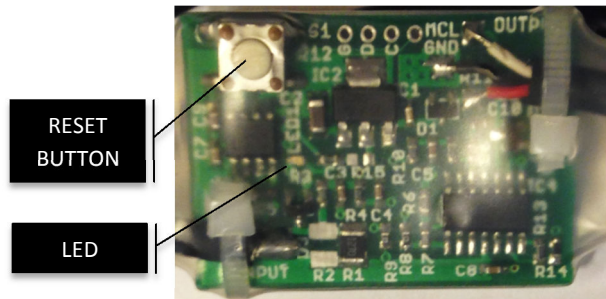


Figure 4: Fuel Sender Wiper mechanism

The following are the steps to calibrate the IRQ-101A:

1. Start with an empty tank and the car turned OFF.
2. Place a voltmeter (or DMM) on IRQ-101A (the unit) output wire (WHITE)
3. Turn the car ON and measure the output voltage from the unit with an empty tank.
4. Carefully add a gallon(or liter) of gas to the tank
5. Press the white RESET button of the unit, Wait until the light comes ON then OFF and ON again.
6. Record the voltage output to use with your DAS.
7. Repeat steps 4 - 8 until the tank is full.

Note: You have to reset the IRQ-101A unit since the algorithm will ignore the sudden change in gas.

Note: Using your DAS to capture the output of the IRA-101A unit will help eliminate any discrepancies in measurements.

ORDERING INFORMATION (www.shop irqengineering.com)IRQ-101A ⁽¹⁾ ⁽²⁾**Notes:**

- (1) Harness length from 1 to 13 ft can be specified with the order. Default order is approximately 3ft.
- (2) Order connector option. Default no connector.
- (3) Please contact us if your application needs a different range value.
- (4) If your sender outputs voltage, we can customize the IRQ-101A to support that configuration.

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www.irqengineering.com
sales@irqengineering.com

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