TWOFLOW MODULE INSTALLATION & OPERATION MANUAL

RMI

ROCKY MOUNTAIN INSTRUMENT
PO BOX 683
THERMOPOLIS, WY 82443

Table of Contents

Technical Specifications

Physical

Size: 2.5W x 3.3L x 1.2H inches
15.9W x 8.4L x 3H cm

Weight: 3.75 ounces
105 grams

Electrical

Operating Voltage: +10 VDC

Operating Current: less than 30ma

Output: Engine Sensor minus Return Sensor

Mechanical

Operating Temperature: -20EC to +70EC

Storage Temperature: -30EC to +90EC

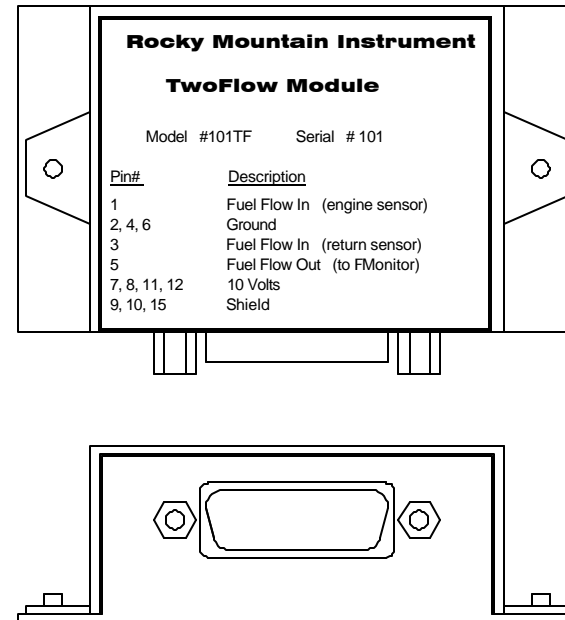Operation Altitude: -2000 to +35000 feet

Installation

Description

On some aircraft engines there is a requirement that some of the fuel not immediately needed by the engine is returned to the fuel tanks. A single fuel flow sensor installed in the fuel line to the engine would result in excessive and erroneous readings of fuel flow.

With the TwoFlow module installed, an additional fuel flow sensor can be installed in the return line back to the tanks and the module will subtract this amount of fuel from the amount going to the engine, resulting in a total of actual fuel being used by the engine.

Drawing

Rocky Mountain Instrument

TwoFlow Module

Model #101TF   Serial # 101

Pin#	Description
1	Fuel Flow In (engine sensor)
2, 4, 6	Ground
3	Fuel Flow In (return sensor)
5	Fuel Flow Out (to FMonitor)
7, 8, 11, 12	10 Volts
9, 10, 15	Shield

Mounting

Location

The mounting location of the TwoFlow module is not critical. It may be mounted either on the pilot side or engine side of the firewall.

Wiring

Refer to the schematic to the right, and figures and detail that follows.

Sensors

Note that the engine fuel flow sensor and the return fuel flow sensor must be connected to the TwoFlow module as shown. The module expects that the engine sensor will show more fuel than the return sensor. In other words, the return sensor connections on the module will always be subtracted from the engine sensor connections. If connected backwards, the output to the FMonitor will be in error.

IMPORTANT: Install the lower K-factor sensor in the return line and enter the average of the two K-factors into the FMonitor. If necessary the K-factor can be adjusted using the formula in the FMonitor operations manual.
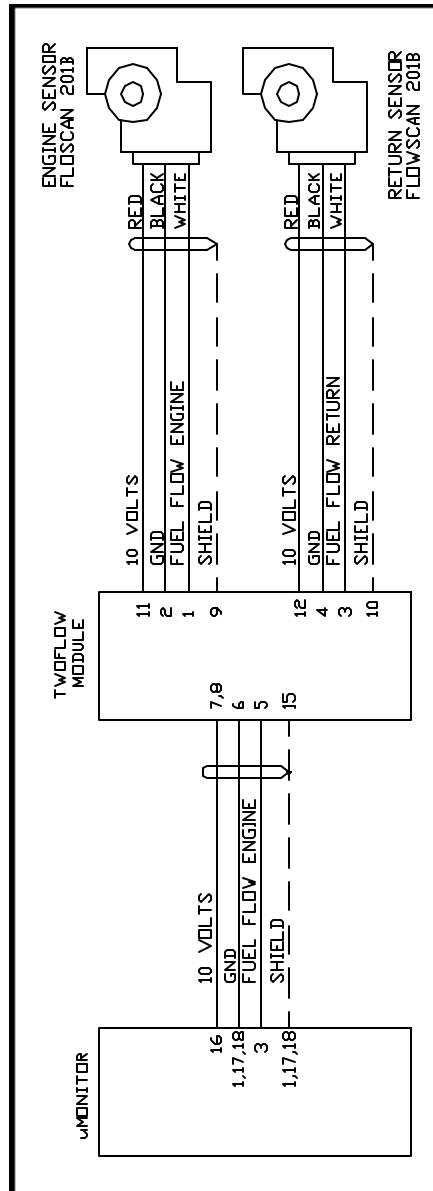

Figure 1 Total schematic wiring.

D-Sub Wiring

Strip and attach terminals as shown in Figure 5. When inserting the terminals into the housing, they must be properly oriented. Rotate the terminal 90E or 180E until it slips in. The terminal will lock in with a click. Make up all the connections to the plug and install the shield before connecting the plug to the TwoFlow module.

Note that the terminal numbers in the plug housing are the mirror image of the numbers in the receptacle on the module. Use the actual numbers molded into the plastic of the plug when connecting per the schematic in Figure 3.
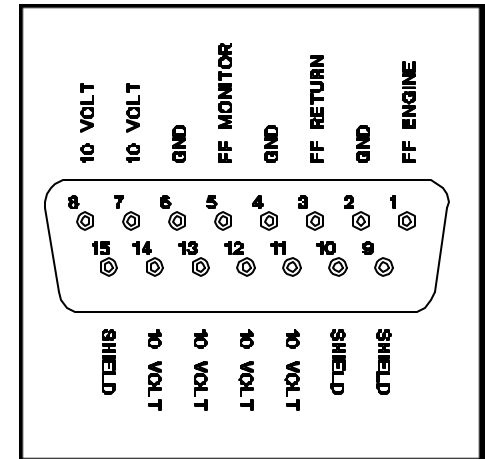

Figure 2 D-Sub connections as viewed toward the module receptacle. Note that some connections are duplicated.
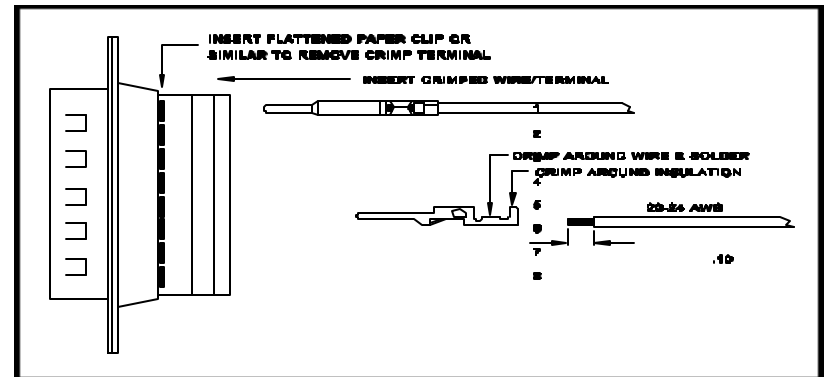

Figure 3 Attaching crimp terminals to wires and making connection to the plug housing. Don't solder if a proper crimp tool is used.

Shield Assembly

After all wire terminals have been installed, assemble the shield cover on the 15-pin D-sub connector using the steps and figure below.

1. Fold back the foil/braided shielding and/or drain wire along the outside insulation. Ignore copper foil tape as shown in the Figure.

2. Install the connector housing into shield cover A and fold the two tall tabs on the cover over the loose wires.

3. Align shield cover B over shield cover A and press shield cover B until it snaps over the lances of shield cover A.

4. Tighten the cover nut. The shield covers should clamp and make contact with each cable shielding and/or drain wire.

5. Install the lock screws and E-rings.
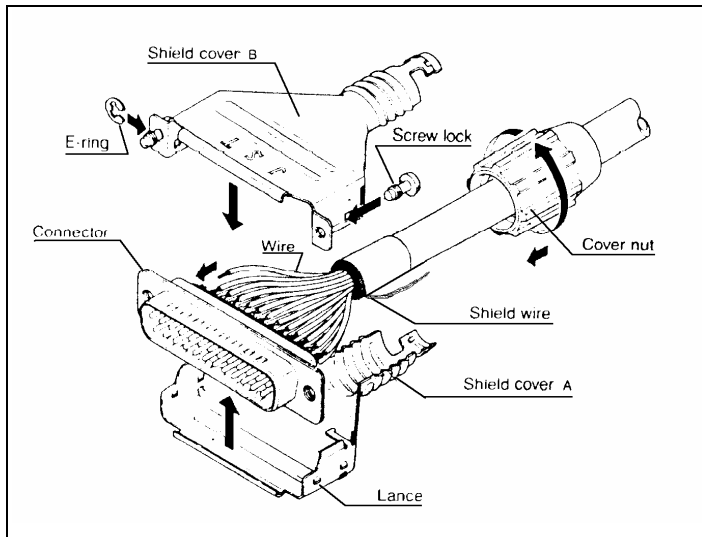
Operation

The TwoFlow module gets its power from the FMonitor so once it has been installed, there is nothing to the actual operation of the fuel flow system.

Since it is nearly impossible to match two fuel flow sensors, there can be a slight error. This can be reduced to a minimum by keeping records of actual fuel used versus what the FMonitor says has been used over a number of flights. This information can be then be entered into a formula to adjust the FUEL FLOW CALIBRATION number as explained in the FMonitor operations manual. This detail is explained in the Programming Extra Features section of the operation manual, function number 5.