FC-10 Installation/Operation Manual

The FC-10 is not approved for installation in certified aircraft.

Installation:

Mechanical

Mount the FC-10 in any 2-1/4" instrument hole using four 6-32 screws.

For Transducer installation information, see the "FT-60 installation instructions" on page three of this manual.

Electrical

The transducer cable is the light tan **three conductor** shielded cable and the data cable is the grey **two conductor** shielded cable. After cutting these cables to their required length strip away approximately 1.5" of the outer insulation. You may need to obtain pins appropriate to your GPS to make the RS-232 data connections. Strip the internal wires and crimp (and solder) on the pins for your GPS. The transducer's wires may be trimmed to the desired length. They should be attached to the supplied harness either with butt splice, fast-on or Molex connectors (not supplied).

Power Cables
   Red (Power) 12-28 Volts DC, Connect to the avionics bus via a 1 Amp fuse – **Pin 1**
   Black (Ground) Avionics Ground – **Pin 2**

Transducer Cable(s) (Three Conductor with braided shield)
   White with Orange Stripe (Transducer Power) Connect this wire to the red wire on the fuel flow transducer - **Pin 3**
   White with Blue Stripe (Transducer Ground) Connect this wire to the black wire on the fuel flow transducer – **Pin 5**
   White (Transducer Signal) Connect this wire to the white wire on fuel flow transducer - **Pin 7 Left** (Single Engine) **- Pin 8 Right** (Optional Second Transducer)

Data Cable (Grey Colored Two Conductor with foil shield and bare drain wire)
   White (Data Transmit to GPS) Connect this wire to your Panel Mount GPS. Handheld GPS do not connect this wire. The associated GPS connection will be labeled Data in, RS-232 RX, Serial Receive (Consult your GPS Manual) - **Pin 6**
   Black (Data Receive from GPS) Connect this wire to your GPS. The associated GPS connection will be labeled Data Out, RS-232 TX, Serial Transmit. (Consult your GPS installation manual) **Pin 9**
   Bare (Data Ground) Handheld GPS units must connect this wire to the Handheld's RS232 ground connection. For all other installations, the shield wires should not be connected and should be trimmed away.

Setup:

After the unit is powered PRESS and HOLD the (Center) **Set** button until "888" is displayed to enter setup mode.

Icons will flash to indicate what is option is being set. Once the desired value is set, press the (Center) **Set** button to move to the next item. Values are changed by pressing the (right) **Action** button to increase and the (left) **Mode** button to decrease the value. Continue setting all options until "888" is displayed again. This indicates the setup process has been completed.

Flashing Icon	Item Being Set	Description
FLOW	Fuel Units	0.0 = Gallons, 1.0 = Liters
RESV	Distance Units	0.0 = Nautical Miles, 1.0 = Statute Miles, 2.0 = Kilometers
L and R ^-Note	Pulses/Gallon/100	FT-60 "Red Cube" - 680, FT-90 "Gold Cube" – 340, Floscan 201B6 - 300
L	Left K Factor (Single)	Value in percent, See instructions below
R	Right K Factor	Value in percent, See instructions below
USED	Fuel Tank Size	In Gallons
EFCY *-Note	Number of Engines	1.0 = Single Engine, 2.0 = Twin Engine,
GPS	GPS Type	0.0 through 4.0 (see GPS table on following page)
WARN	Low Fuel Warning	In Minutes
REQD #-Note	Flow Response Rate	0.0 = Normal (Recommended), 1.0 = Faster, 2.0 = Faster Still, 3.0 = Fastest

   *Note: If you have a single engine installation with a second sender for fuel return to the tank, set "1.0".
   #Note: This feature only available on Firmware 1.2 or greater. ^Note: This feature only available on Firmware 1.3 or greater

Fuel Efficiency will be displayed in different units depending on the combination of Fuel Quantity units and Distance units selected. See table:

Fuel Units	Distance Units	Fuel Efficiency Units
Gallons	Nautical Miles	Nautical Miles/Gallon
Gallons	Statute Miles	Statue Miles/Gallon
Gallons	Kilometers	Kilometers/Gallon
Liters	Nautical Miles	Nautical Miles/Liter
Liters	Statute Miles	Statue Miles/Liter
Liters	Kilometers	Liters/100 Kilometers

Setting K-Factor - K-Factor is a parameter that is adjusted to calibrate the fuel flow sensor to your installation. To determine the K-Factor, compare the actual fuel used to the calculated fuel used on the FC-10. It will be necessary to compare fuel consumption for several tanks of fuel to decide by what percentage to adjust the K-Factor. If the actual fuel used is more than the calculated fuel used, increase the K-Factor percentage. Likewise, if the actual fuel used is less than the calculate fuel used, decrease the K-Factor percentage.

The FC-10 K Factor values are in displayed in Percent K-Factor with 100 percent as the baseline. Use the following formula and examples to determine the K-Factor for your installation.

K-Factor % = 100 X (actual fuel used – computer fuel used) / actual fuel used

Example 1:	Example 2:
Actual fuel Used = 18.3 Gallons	Actual fuel Used = 26.7 Gallons
FC-10 Computer fuel used = 19.1 Gallons	FC-10 Computer fuel used = 24.9 Gallons
K-Factor = (18.3-19.1)/18.3 = -.044 = -4%	K-Factor = (26.7-24.9)/26.7 = .067 = 7%
Thus, K-Factor needs to be reduced by 4% **from its current value**.	Thus, K-Factor needs to be increased by 7% **from its current value**

Configuring your GPS –

Consult the GPS Installation/Operation manual to locate "Serial Interface, I/O, RS-232, Serial Data, Data In/Out" setup pages on your GPS. There are several different names for this function.

Panel Mount – Select "Aviation Out" or "Move Map" for the Output format. See table below for the input format. If Baud rate is adjustable, choose 9600 baud.

Portable – Select "NMEA" or "NMEA 0183" for the Output format at 4800 Baud. Garmin 696/796/Aera may choose 9600 Baud. The FC-10 does not output information to portable GPS receivers.

FC-10 GPS Mode	Input to FC-10	Output from FC-10
0 - #	NMEA@9600 Baud - Garmin 696/796/Aera	None
1	NMEA@4800 Baud – Portable GPS	None
2	Aviation - Panel Mount GPS	"Shadin Z" – Compatible with UPS/Apollo, Garmin and others (Recommended)
3	Aviation - Panel Mount GPS	"King A" – Compatible with ARNAV, King, Garmin and others
4	Aviation - Panel Mount GPS	"Shadin Generic" – Compatible with Garmin and others

- Firmware Rev 1.5 and greater

Operation:

Modes: The FC-10 has Seven modes.

   PRESS the (Left) **Mode** button the switch between modes.

   PRESS and HOLD the (Left) **Mode** button to display the Firmware Version number.

FLOW – Fuel flow Gallons/Hour or Liters/Hour PRESS the **Action** button to toggle between Left and Right engines on twin engine systems	**USED – Fuel used since power up** Gallons or Liters PRESS the **Action** button to toggle between Left and Right engines on twin engine systems **Note**: Fuel used is reset to 0.0 when the unit is powered off
RMNG – Fuel remaining Gallons or Liters PRESS the **Set** button to change the fuel remaining. The "RMNG" icon will flash. PRESS the **Action** button to increase the value and the **Mode** button to decrease the value. To quickly fill the tank press and hold the **Action** button until the full fuel value is displayed.	**WARN –** Fuel remaining is less than low fuel level warning quantity **GPS –** Usable GPS data is being received **L** – Left Flow Sensor Information **R** – Right Flow Sensor Information
ENDR – Fuel Endurance Hours:Minutes (or Distance with GPS) If connected to a GPS, the **Action** button may be pressed to toggle between the endurance distance or endurance in hours and minutes.	**RESV – Fuel Reserve at active GPS waypoint** (GPS Required) Hours:Minutes or Distance PRESS the **Action** button to toggle between fuel quantity remaining and flight time remaining at the next waypoint
EFCY – Fuel economy (GPS Required) See Efficiency units table for Units	**REQD – Fuel required to active GPS waypoint** (GPS required) Gallons or Liters

Specifications:

Input Voltage: 12-28 Volts DC
Current Draw: ~70mA @13.5 Volts
Dimensions: Fits a Standard 2-1/4" instrument hole.
Overall Width and Height 2.375"X 2.375", Depth behind panel 0.67 "
Weight: 3.0 oz.

Need Help?
support@fdatasystems.com
or call (831) 325-3131

FT-60 Transducer Installation Instructions

Fuel Flow Transducer Notes

- **NEVER** blow through the transducer. Keep the yellow caps on until it is installed.
- The fuel flow transducer(s) should be installed in a straight section of your fuel line. (6 straight inches on each side is desirable).
- The fuel line should not drop down after exiting the transducer.
- The wires **MUST NOT** come out of the bottom of transducer. Wires pointing up is best.
- When assembling fittings into the 1/4" NPT inlet and outlet ports do not exceed a **torque value of 25 ft.-lbs.**
- Do not use Teflon tape in an aircraft fuel system. Use "Fuel Lube/Ez Turn Lubricant"
- The transducer should be mounted down stream of a fuel filter.
- Do not attach the transducer directly to the engine to avoid excessive vibration.
- Do not mount the transducer near the exhaust systems or other hot engine components.
- If the transducer is in the engine compartment, it should be covered in fire sleeve to protect it from excessive heat.
- The transducer wires may be trimmed any desired length

Possible Transducer Placement Locations:

1. Between the auxiliary electric boost pump and the engines mechanical fuel pump.
2. Between fuel injection servo and the distribution block.
3. Between the Engine driven pump and the Carburetor

Note: If your engine is equipped with a fuel return line **from the carburetor or fuel injector manifold** back to the fuel tank you will need to install two flow transducers. One in the feed line from the fuel pump to the carburetor and one in the return line from the carburetor back to the fuel tank. This applies to certain Continental engines and Rotax 912(ULS) and 914 engines.

Suggested Installation Hardware: 2 Each, AN816-6D nipple, AN818-6D nut, AN819-6D sleeve. This will allow splicing of the transducer into 3/8" (-6) aluminum fuel line.
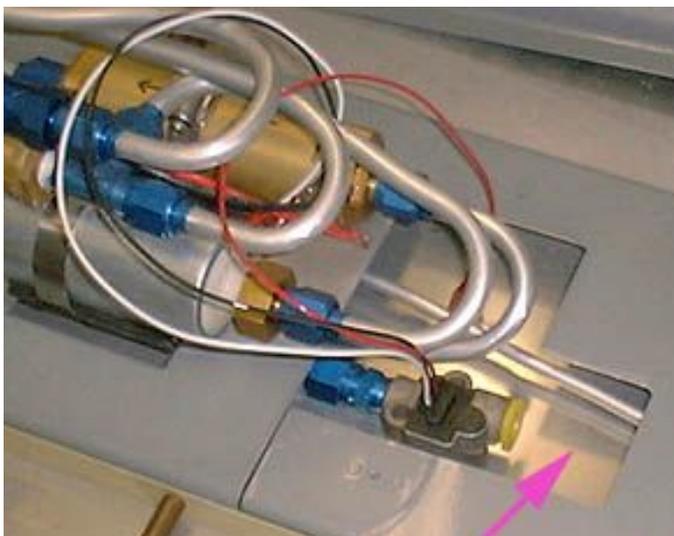
RV-7 Fuel Injected
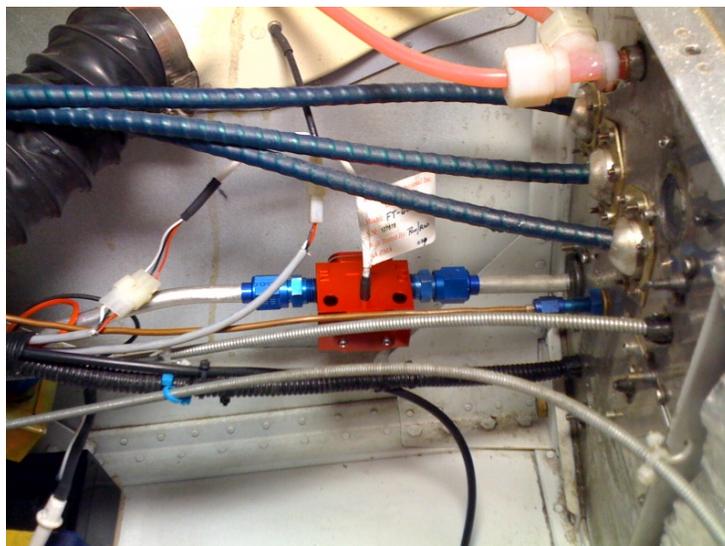
RV-8 Carburated

EI FT-60 "Red Cube" Specifications:

Flow Range , Gasoline: 0.6 – 70+ GPH,
Approximate K Factor (Pulses/Gallon):68,000
Pressure Drop: 0.5 PSI @ 28 GPH, 2.0 PSI @ 56 GPH
Repeatability +/- ¼%
Working Pressure: 100 PSI psi
Temperature Range: -65° / 125°C
Bearing Life Expectancy: 10,000 hr. min.
Electrical Specifications:
8-30 VDC between RED (+) wire and BLACK (-) wire. @ 14 mA
Weight 5.26 Oz.