



This document set is applicable to the following part number configurations:

 <p>Two Tank Fuel Level for Cirrus Aircraft with CIES Inc. TSO'd Fuel Senders</p>	<table border="1"> <thead> <tr> <th rowspan="2">Part Number</th> <th colspan="2">Kit Configuration</th> </tr> <tr> <th>Instrument</th> <th>Sensor</th> </tr> </thead> <tbody> <tr> <td>FL202G</td> <td>FL202G</td> <td>Use with CIES Inc. TSO'd fuel senders on Cirrus Aircraft SR20, SR22 and SR22T models only.</td> </tr> </tbody> </table>	Part Number	Kit Configuration		Instrument	Sensor	FL202G	FL202G	Use with CIES Inc. TSO'd fuel senders on Cirrus Aircraft SR20, SR22 and SR22T models only.
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	Instrument	Sensor							
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 <p>TSO'd Fuel Senders</p>	<p>TSO'd fuel senders for this instrument are provided by:</p> <p>CIES Inc. 221 SE Timber Ave. Redmond OR, 97756 www.ciescorp.com</p>
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Dual Fuel Level – Cirrus Aircraft w/ CIES Inc. Senders

THIS IS A TRANSPORT CANADA APPROVED MANUAL

The following checklist outlines the required articles for all FL202G products:

Documentation	Document Number
<input type="checkbox"/> Introduction (this document)	S200-FL202G-001
<input type="checkbox"/> Warranty Statement	S200-AWS
<input type="checkbox"/> Installation Instructions	S200-FL202G-002
<input type="checkbox"/> Intensity Control Installation Options	S200-DDC-INST
<input type="checkbox"/> Wiring and Installation Schematic	S200-FL202G-003
<input type="checkbox"/> Human Interface Definition	S200-HID
<input type="checkbox"/> Instrument Setup	S200-FL202G-004
<input type="checkbox"/> Operations Guide	S200-FL202G-005
<input type="checkbox"/> Product Specifications	S200-FL202G-006
<input type="checkbox"/> Installation Compliance	S200-FL202G-007
<input type="checkbox"/> Instructions for Continued Airworthiness	S200-ICA
<input type="checkbox"/> Flight Manual Supplement	S200-FMS (If applicable)
<input type="checkbox"/> Authorized Release Certificate	FORM ONE
<input type="checkbox"/> Permission to Use STC	S200-PTU
<input type="checkbox"/> Canadian STC and Eligibility List	STC & S200-CEL
<input type="checkbox"/> FAA STC and Approved Model List	STC & S200-AML

Components

- FL202G Instrument and harness
- 4 X Mounting Screws
- TSO'd fuel senders to be acquired from CIES Inc.

Dual Fuel Level – Cirrus Aircraft w/ CIES Inc. Senders

The Fastest Way To Install And Start Using This Product

NOTE: This product is certified as a primary replacement, new or secondary instrument only when installation is performed in accordance with the documented instructions and procedures.

1. Review the Warranty Statement before performing any tasks. Do not remove the instrument from the sealed package until you agree with the stated terms.
2. If this instrument is to be installed in a certified aircraft, verify that the aircraft model is listed on the Eligibility List (Canadian registered aircraft) or the Approved Model List (USA and all other countries).

If it is NOT listed, contact your local authority and obtain the necessary requirements or approvals before proceeding further.

For all other vehicles, including experimental aircraft continue with Step 3.

3. Follow the Installation Instructions exactly as noted, referring to the Wiring Diagram as and when required. Note: The installation process has been optimized based on the sequence of components to be installed. Installing the product in any other way will, in all likelihood, take longer and be more complex.

Ensure that **one** of the Intensity Control options has been installed in accordance with document # S200-DDC-INST.

4. Perform the Instrument Setup using the required data as listed in the Instrument Setup procedure.
5. Validate that all functions perform as outlined in the Operations Guide.
6. Complete all regulatory documentation, if required.

FL202G Installation Instructions

1. The FL202G instrument uses CIES Inc. TSO'd aircraft fuel senders for fuel level sensing. Ensure that all senders have been installed and wired in accordance with the following CIES Inc. wiring diagrams:
 - a. CB2840570001 Page 4 (for SR22 / ST22T), or
 - b. CB2840570002 Page 3 or 6 (for SR20),

of the most current revision.
2. Connect the wiring supplied with the DB25 interface connector in accordance with the FL202G Wiring and Installation Schematic. **DO NOT ATTACH THE CONNECTOR TO THE INSTRUMENT UNTIL ALL WIRING HAS BEEN CONNECTED.**
3. **Ensure that the sender power and instrument power are connected to the same switched supply.**
4. Select the instrument location in the aircraft panel.
5. Ensure that the aircraft master switch and/or power to the instrument is **OFF**.
6. Attach the DB25 connector to the instrument. Ensure that the plug is fully inserted into the instrument. Finger tighten the two plug locking screws, then tighten 1/8 turn using a screwdriver. **DO NOT OVERTIGHTEN.**
7. If the instrument is to be installed to the right of the pilot's field of view, the DB25 connector on the rear of the instrument **MUST be closest to the bottom** of the instrument panel. Proceed with step 8.
8. If the instrument is to be installed in front of or to the left of the pilot's field of view the DB25 connector on the rear of the instrument **MUST be closest to the top** of the instrument panel.
9. Install the instrument in the panel, attaching with four 6-32 X 3/8" screws.
10. Initial Power Up Sequence:
 - a. Adjust the instrument intensity control for maximum intensity.
 - b. Apply power to the instrument.
 - c. The instrument display will light up.
 - d. The display may be inverted at this point. Ignore the orientation at this time.
 - e. Turn the instrument **OFF**.

FL202G Installation Instructions

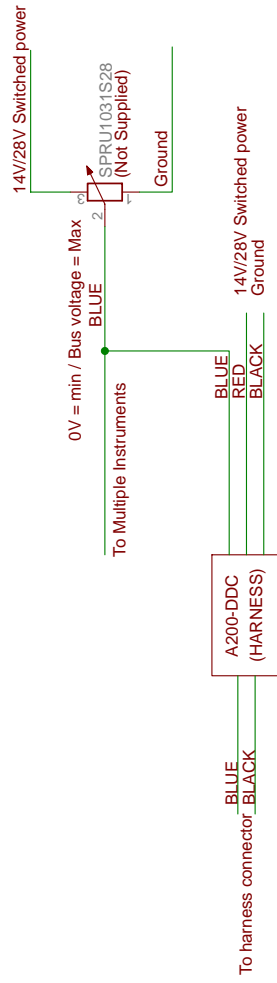
11. If the instrument display does not light up:
 - a. Ensure intensity control is set for maximum.
 - b. Turn off power.
 - c. Disconnect the DB25 connector from the instrument.
 - d. Check intensity control.
 - e. Check the wiring installation and breaker or fuse.

12. Proceed to “Instrument Setup”.

Connection to Panel Rheostat



Connection to Independent Potentiometer Control



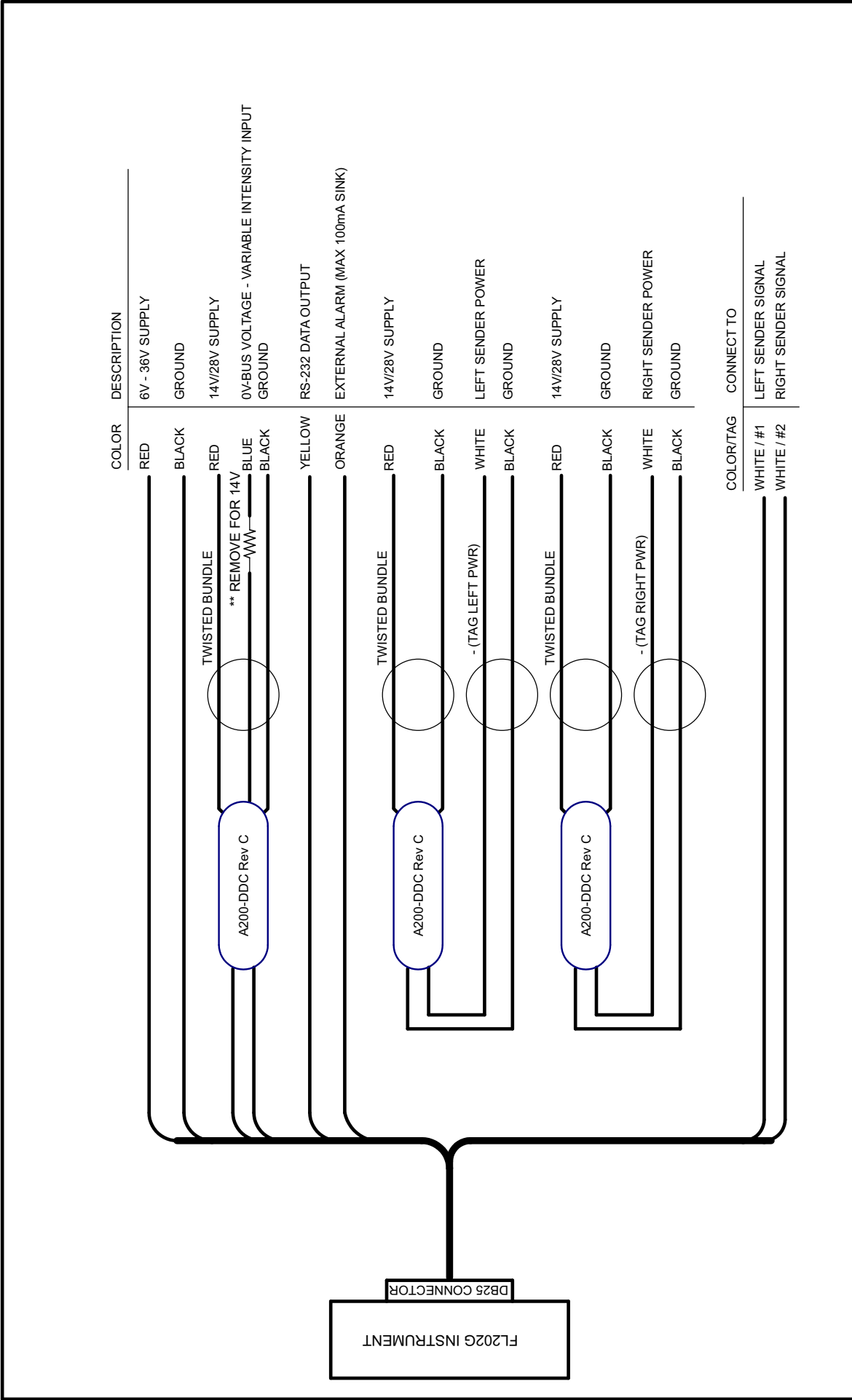
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(c) 2009-2012 Aerospace Logic Inc.

Document Number:
S200-DDC-INST

REV:
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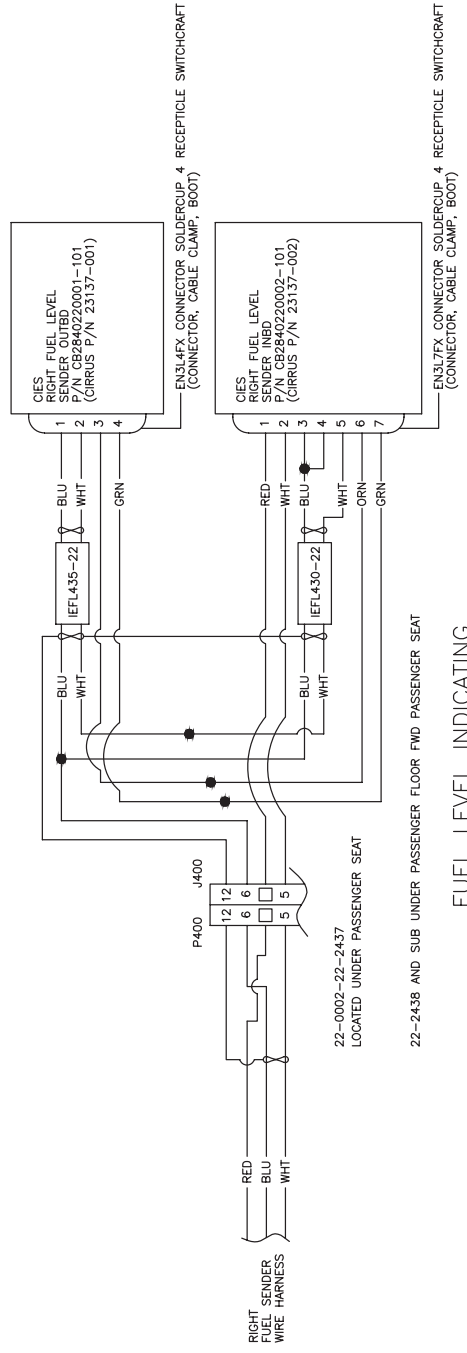
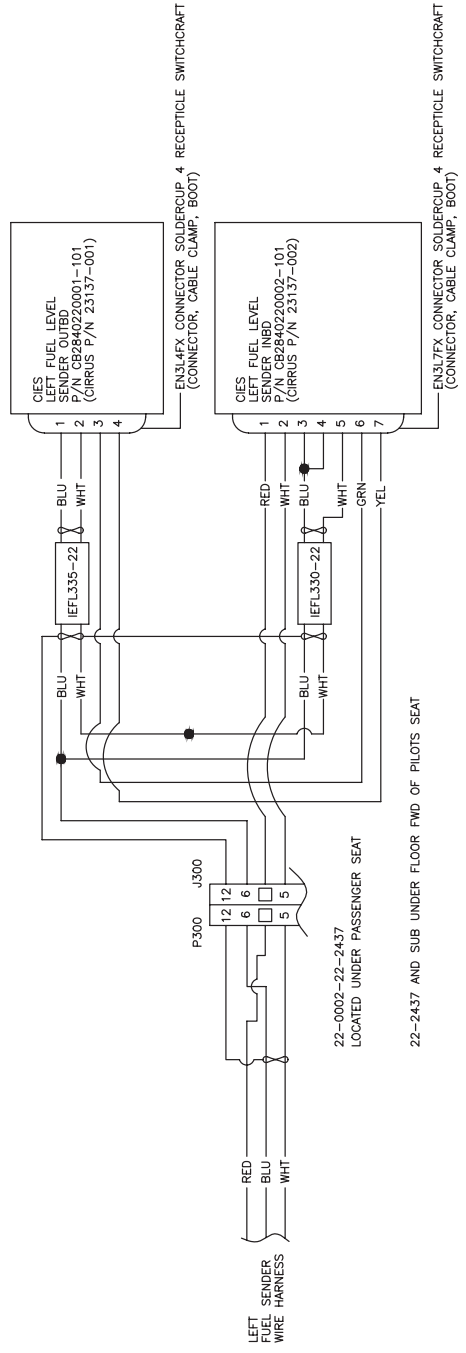
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- INSTALLATION NOTES:**
1. Allow for current drain of 0.1A (100mA)
 2. Install using breaker or panel fuse
 3. Maximum 7 instruments per 1A of breaker capacity
 4. For multiple instrument installations install breakers to comply with redundancy requirements of AC 23.1309-1D Appendix 1
 5. Connect all BLACK (GROUND) wires to the same ground point

- ACCESSORY NOTES:**
1. ** Remove for 14V operation
- SENDER NOTES:**
1. Only to be used with CIES Inc. TSO'd fuel senders
 2. See Installation Instructions for sender wiring
 3. Only for installation on Cirrus Aircraft SR20, SR22 & SR22T



FUEL LEVEL INDICATING
 SERIAL 22-0002 THRU 22-2437
 SERIAL 22-2438 & SUBS W/O PERSPECTIVE
 SERIAL 22-3026 & SUBS W/ PERSPECTIVES,
 22T-0001 & SUBS

791 NW TRENTON AVE
 BEND, OR 97701

CIES INC

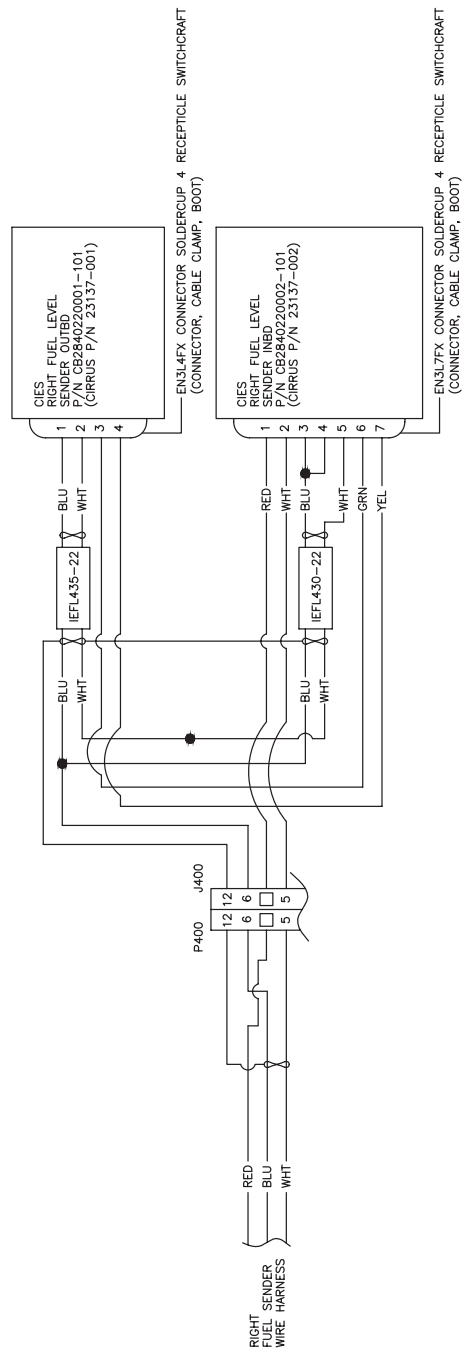
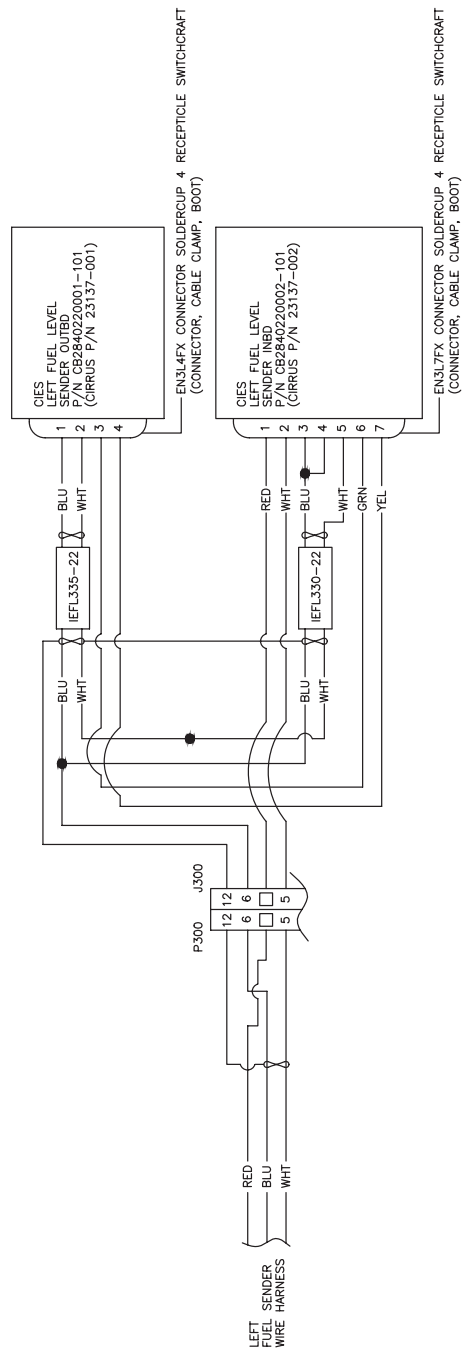
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 LEVEL SENDER CIRRUS SR-22**

SIZE CAGE CODE
B 66YY1

DWG NO.
CB2840570001

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SCALE
 SHEET 4 OF 5



FUEL LEVEL INDICATING
SERIAL 1878, 1886 & SUBS W/O PERSPECTIVE
SERIAL 2016 & SUBS W/ PERSPECTIVE

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CIES INC

TITLE
**WIRING MODIFICATION FUEL
LEVEL SENDER CIRRUS SR-20**

SIZE PAGE CODE DWG. NO. REV.
B 66YY1 CB2840570002 -

SCALE SHEET 6 of 6

200 Series Human Interface Definition – Rev 1.0

All 200 Series instruments have been designed around a standard Human Interface protocol. This allows identical operation of the two panel switches between all instruments while still allowing multiple functions. This document is a generic outline of the functionality of the switches, based on the various functional states of the instrument.

Top Button

The top button is the action button. It invokes different screen displays, allows selection of values and increments or decrements values.

Examples of these actions are:

1. Moving between display screens
2. Selection of an action from a menu
3. Changing a value from within the setup menus
4. Entering a value during flight (clock instrument only)

Bottom Button

The bottom button is the navigation button. It will allow the cursor on the screen to move between allowable selections.

Examples of these actions are:

1. Selection of different cylinders (EGT and CHT) in the Single Cylinder mode
2. Selection of different tanks (Fuel Level)
3. Selection of limits and functional items from within the setup menus
4. Time field selection (clock instrument only)

There is one exception to the functionality of the bottom button. This is from the Primary Display (the screen that first comes on from power up). Pressing the button will display the instrument core status and support data.

General

1. Each specific instrument contains detailed button options within the Operations Guide.
2. During setup, instructions are provided on screen and use of the buttons is as noted in this document.

Aerospace Logic Inc.

180 James Street South, Suite 205, Hamilton, ON, L8P 4V1, CANADA
Tel. 416-628-0725 | www.aerospacelogic.com | Fax. 416-352-5854

WARNING

THIS INSTRUMENT MAY ONLY BE INSTALLED ON CIRRUS SR20 AND SR22 SERIES AIRCRAFT EQUIPPED WITH CIES INC. FUEL SENDERS.

IT HAS BEEN PRE-CONFIGURED FOR THIS INSTALLATION CONFIGURATION AND WILL NOT WORK CORRECTLY WHEN INSTALLED IN ANY OTHER AIRCRAFT.

1. Color indications of the level indication bars have been preset based on Cirrus data for the specific aircraft. These values of usable fuel are automatically set when the instrument is calibrated:
 - a. For SR20:
 - i. Red line less than 0.1 USG
 - ii. Yellow line 0.1 USG to 8.2 USG
 - iii. Green line for all quantities above 8.2 USG
 - b. For SR22:
 - i. Red line less than 0.1 USG
 - ii. Yellow line 0.1 USG to 14.0 USG
 - iii. Green line for all quantities above 14.0 USG
2. The fuel imbalance warning values have been preset based on Cirrus data for the specific aircraft. These values are automatically set when the instrument is calibrated:
 - a. SR20 - 7.5 USG
 - b. SR22 - 10.0 USG
3. This instrument requires calibration before it will function. To calibrate each tank you will be required to add fuel at TWO gallon increments, starting with the unusable fuel in the tank (the legal, zero fuel point).
 - a. Place the aircraft in a level flight attitude and support the aircraft wings, if necessary.
 - b. Drain all tanks to be calibrated.
 - c. Disable any cross feed between tanks.

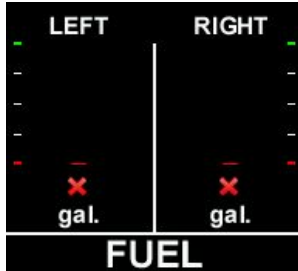
FL202G Instrument Setup

- d. Place the unusable fuel in each tank to be calibrated.
 - e. Complete the calibration process by following the interactive, instructions provided throughout the process on the instrument display (See 4).
 - f. Calibration time is approximately one minute per two gallons of fuel.
 - g. Note the calibration values on the provided calibration sheets. This value serves two purposes.
 - i. It demonstrates a compliant installation, and
 - ii. Provides a hard copy backup of all calibration data.
 - h. It is not necessary to complete the full calibration at once. Calibration can be resumed at any point of the process by re-entering the setup.
4. To enter parameters and perform the calibration, proceed as follows:
- a. Turn off the power to the instrument
 - b. Press and hold both top and bottom buttons and turn on the power to the instrument.
 - c. When instructed, release both buttons.
 - d. In the setup menus, use the bottom button to navigate and the top button to select an option.
 - e. Follow the onscreen instructions to enter the correct operating parameters. ***NOTE: Depending on the installation orientation of the instrument the display may initially be upside down. The first prompt in the setup is to press the button at the top of the instrument. This will orientate it correctly.***
 - f. To perform the instrument calibration, follow the instructions provided on the instrument screen.
5. Once all calibration has been completed the instrument will be enabled and be ready for use.

FL202G Operations Guide

This manual outlines the operating procedures for the FL202G product

1. Pre-Calibration Display – Default Screen



**FUEL INSTRUMENT NOT INSTALLED
CORRECTLY FLIGHT PROHIBITED**

2. Power Up / Default Screen



Displays the fuel level in each tank. Colors are determined by the range values as set during installation.

The quantity in each tank is permanently displayed beneath each indicator bar.



A flashing yellow bar on either side indicates a fuel imbalance condition. The flashing tank indication will be that of the tank with the most fuel. Switch the fuel supply to that tank to begin burning fuel from the imbalanced tank.

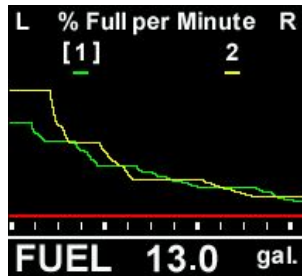
Once sufficient fuel has been burned to fall below the imbalance warning, the flashing yellow bar will return to its correct color indication for the specific fuel level.

Imbalance limits are fixed values for the specific aircraft.

Press the top button to move to the next display screen.

FL202G Operations Guide

3. Trend Graph



This screen provides a graphical display of fuel usage, since the most recent power on.

The graph spans a time period of 192 minutes (3 hours 12 minutes). Once this graph area has been populated it will scroll to the left.

The fuel value displayed at the bottom of the screen relates to the selected tank as indicated by the bracketed tank number at the top of the screen. Use the bottom button to scroll between tanks. Press the top button to return to the default screen.

4. Other Options

To display the instrument serial number and core information press and hold the bottom button when the instrument is first powered on.

WARNINGS

1. **NEVER RELY SOLELY ON ANY FUEL INDICATION INSTRUMENT FOR THE DETERMINATION OF AVAILABLE FUEL.**
2. **WHEN USED IN CONJUNCTION WITH A PHYSICAL INSPECTION, DETERMINATION OF AVAILABLE FUEL PLUS NECESSARY FLIGHT DURATION AND CONDITION CALCULATIONS, A FUEL LEVEL INSTRUMENT BECOMES A VALUABLE COCKPIT RESOURCE.**
3. *All operations are to be performed in accordance with the specific instructions pertaining to your aircraft, including those provided by the engine manufacturer. The FL202G instrument is only a parameter reporting device which can assist in engine and flight management when used in conjunction with these instructions.*
4. *The FL202G product is certified as a primary replacement **ONLY**, within the limits as described above.*
5. **IT MAY BE INSTALLED AS A PRIMARY OR SECONDARY INSTRUMENT ON CIRRUS AIRCRAFT WHICH HAVE "Cirrus Perspective Software Revision v0764.15 or later installed".**

IT MAY BE INSTALLED AS A PRIMARY INSTRUMENT WHEN USED IN CONJUNCTION WITH CIES INC. TSO'd FUEL SENDERS, WHICH HAVE BEEN INSTALLED IN ACCORDANCE WITH CIRRUS AIRCRAFT CORPORATION INSTRUCTIONS AND CONNECTED AS PER THE FL202G INSTALLATION INSTRUCTIONS.

FL202G Product Specifications

Certification / Compliance

TSO	C55a
Environmental	DO-160F
	A1CAASXXXXXXXXZBXXBBBCSBA1C11XXAX
Software	DO-178B

DC Power Source

Input voltage	6 to 36 VDC
Power consumption	100mA
Load dump tolerance	+60V
Direct spike tolerance	+/- 60V
Cable spike tolerance	> +/- 1KV

Operating Temperature

Constant operating	-15°C to +55°C
Short term operating (1hr)	-40°C to +70°C
Storage	-55°C to +85°C

Signal Input

5.0V Pulse Width Modulated

Sender Type

CIES Inc. TSO C55A Qualified Senders

Display

Fuel Quantity US Gallons or Litres

Accuracy

Fuel Quantity AS405C +/- 1 USG

Range

0 to 120 USG (defined by fuel sender/tank size)

Display

Sunlight readable LCD
176 X 192 display pixels, 65,535 colors

Annunciator Output

100mA sink with reverse EMF protection

RS-232 Data Output

1 second per full sequence at 57.6K bps (8/N/2/N)

Interface Connector

DB-25

Software Functionality

Primary	Fuel level in all tanks
Fuel Imbalance	Installer selectable SR20 or SR22
Trend Graph	Graphic display of level vs time

Dimensions

2.45" X 2.45" X 0.96"

Weight (excluding harness)

4.05 oz

Finish

Black anodized 6061 aluminum

FL202G Installation Compliance

1. Installation Procedures and Limitations

Should your specific aircraft not be listed on our STC Approved Model List (AML), contact your local FSDO or flight authority for installation requirements **BEFORE commencing any installation tasks.**

Installation must be in accordance with the following FL202G published documents:

- a. Installation Instructions,
- b. Wiring and Installation Schematic, and
- c. Instrument Setup.

2. Installation Location and Visibility

The products are to be installed in existing panel holes and will replace existing instrumentation. As primary replacement products it is recommended and preferred that they be placed in the same panel location as the original equipment. Their visibility and placement relative to other instruments are the same or similar to the existing instruments. Where they are installed in a different location it is the responsibility of the installer to ensure that they are visible to the pilot under all conditions.

3. TSO COMPLIANCE NOTICE

The conditions and tests required for TSO approval of this instrument are minimum performance standards. Those installing this instrument on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The instrument may be installed only according to 14 CFR part 43 or the applicable airworthiness requirement.