

RADIANT

TECHNOLOGY

User Manual

RFGA Resistive Fuel Gauge

RFGA 0-5V Capacitive Fuel Gauge

Technical Specifications / Installation / Operation / Calibration
May 27, 2026

THIS UNIT IS NOT STC'd, TSO'd, OR BUILT IN A PMA FACILITY. Use ONLY in experimental, ultralight, and Light Sport Aircraft with manufacturer approval.

INTRODUCTION

RADIANT Technology's RFGA fuel gauges are compact, sunlight-readable fuel instruments for experimental, ultralight, and qualifying Light Sport aircraft. The RFGA family is offered in two versions: a Resistive Fuel Gauge and a 0-5V Capacitive Fuel Gauge for either 2 1/4" or 3 1/8" cutouts, with dual or single displays.

Both products share the same display philosophy: a clear analog-style fuel dial, large digital percent, fuel quantity, fuel-use trend information, and a calibration system that adapts the instrument to the sender and tank actually installed in the aircraft.

- RFGA Resistive Fuel Gauge - for passive resistive senders connected to ground, including conventional and reverse-acting sender curves within the measurable range of the instrument.
- RFGA 0-5V Capacitive Fuel Gauge - for analog sender systems that provide a voltage output in the 0 to 5 volt range.
- Each product supports single-tank or dual-tank display configuration.
- Calibration may be performed with 2, 3, or 5 points so the display can match the actual tank and sender behavior.
- Resistive units show resistance of the fuel sender in real time
- Resistive units show short or open of fuel sender in real time
- Capacitive units show voltage from fuel sender in real time
- Gallons, Imperial Gallons and Liters are supported
- Each tank may have unique fuel capacity assigned
- Fuel flow rate is automatically computed and saved from history
- Fuel remaining is shown for each tank in the selected units
- Each tank has a companion graph showing fuel level over time (last hour)
- Units are designed for 2 1/4" or 3 1/8" cutouts. Some notching is required for 2 1/4" instrument holes.

Product	2-1/4 in. case	3-1/8 in. case
RFGA Resistive Fuel Gauge	RFGA-022R-GEN2 Aircraft Spruce 10-07487	RI-2024-15-RFGAR Aircraft Spruce 10-07722
RFGA 0-5V Capacitive Fuel Gauge	RFGA-022C-GEN2 Aircraft Spruce 10-07486	RI-2024-14-RFGAC Aircraft Spruce 10-07721

Note: Some listings may describe the 0-5V Capacitive Fuel Gauge as the capacitive version.

TECHNICAL SPECIFICATIONS

Item	Specification
Display	Sunlight-readable, high-contrast color display
Display modes	Single tank or dual tank
Fuel level display	Analog-style dial, large percent, quantity in selected units, and trend/history display
Input - Resistive version	Passive resistive sender to ground; user-calibrated; supports rising or falling ADC curves
Input - 0-5V Capacitive version	Analog voltage sender output, nominal 0 to 5 V; user-calibrated; supports rising or falling voltage curves
Calibration points	2, 3, or 5 points per tank
Units	US gallons, liters, or imperial gallons
Brightness	Internal brightness control, 8 steps, adjusted from the front buttons
Power	+9 to +16 VDC; use 1 A fuse or breaker
Harness	Four wires: red power, black ground, white left/single tank sender, orange right tank sender
Case	Black nylon with chopped carbon fiber, 3D printed
Mounting	2-1/4 in. rectangular installation or 3-1/8 in. round panel installation, depending on model
Operating temperature	-20 to +60 C

Important sender note: The Resistive Fuel Gauge is for passive resistance senders. The 0-5V Capacitive Fuel Gauge is for analog voltage-output senders. Digital, CAN, PWM, frequency, current-loop, or capacitive probes that require a separate excitation/conditioning module are not covered by this manual unless they provide a compatible analog output to the RFGA input.

DISPLAY OVERVIEW

The RFGA display is designed to show the information a pilot wants at a glance. In normal operation, the active tank display includes fuel level as an analog dial, large percent, quantity in the selected units, and trend information. Dual-tank mode presents both tanks simultaneously.



2 1/4" Dual Resistive and Single Capacitive, both showing graphing over time.



3 1/8" Dual and Single gauges in various conditions after turn on

INSTALLATION

- Install the instrument in the appropriate panel opening for the case size purchased. Use the supplied mounting hardware.
- The RFGA has four external wires: power, ground, and two sender inputs.
- Attach the black wire to aircraft ground.
- Attach the red wire to aircraft power, +9 to +16 volts DC. Do not exceed 16 volts. Use a 1 amp fuse or circuit breaker and an avionics master switch.
- Route sender wires away from ignition wiring, alternator wiring, strobe wiring, and other high-noise conductors where practical.
- After wiring, verify that the instrument powers on and that the screen is readable in the intended cockpit mounting location.

Wire Harness

Wire color	Connection
Black	Aircraft ground
Red	Aircraft power, +9 to +16 VDC
White	Left tank sender input, or the single tank sender input
Orange	Right tank sender input

Important: The white wire is always LEFT, or the single tank input. The orange wire is always RIGHT. In SINGLE mode, use the white sender wire and leave the orange sender wire insulated and unconnected.

Sender Wiring - Resistive Fuel Gauge

- Connect the appropriate RFGA sender input wire to the sender wiper/output
- For a dual-tank installation, connect WHITE to the left sender and ORANGE to the right sender.
- For a single-tank installation, connect WHITE to the sender and leave ORANGE insulated and unconnected.
- The sender body or sender ground terminal MUST be connected to aircraft ground. The RFGA determines sender resistance by measuring the sender path to ground.
- If the sender is not grounded, the instrument will usually show an OPEN fault for that tank.

- The calibration process supports normal and reverse-acting senders, provided the captured points form a monotonic curve.

Sender Wiring - 0-5V Capacitive Fuel Gauge

- Connect the appropriate RFGA sender input wire to the sender voltage output.
- For a dual-tank installation, connect WHITE to the left sender output and ORANGE to the right sender output.
- For a single-tank installation, connect WHITE to the sender output and leave ORANGE insulated and unconnected.
- Connect sender ground and instrument ground to a common aircraft ground reference.
- The voltage signal must remain within the 0 to 5 volt range during normal operation. Do not connect aircraft bus voltage directly to the sender input.
- The calibration process supports voltage rising with fuel level or falling with fuel level, provided the captured points form a monotonic curve.

NORMAL OPERATION

- Turn the unit on using the aircraft avionics or instrument power switch.
- In normal operation, a brief press of either front button cycles the display brightness through the available dim levels.
- Fuel level is updated continuously. The display shows percent and fuel quantity based on the calibration table and selected capacity.
- In dual-tank mode, left and right tanks are shown simultaneously. In single-tank mode, only the white sender wire and left capacity are used.
- If a sender fault is detected on the Resistive Fuel Gauge, the affected tank is shown as empty and the fault badge replaces the normal fuel-use readout. A fault is shown in Figure 2; where the right tank is indicating a short in red letters.

Fuel Quantity and Units

The setup screen allows the user to choose US gallons, liters, or imperial gallons. Tank capacity is entered in the selected setup process. The RFGA computes displayed quantity from calibrated fuel percent and the stored tank capacity.

Trend / History Display

The instrument includes a small trend/history display so the pilot can see recent fuel-level behavior. This is especially helpful when evaluating slosh, sender behavior, and fuel-use trend over time. The trend display is advisory and does not replace direct fuel management and preflight fuel planning.

Fuel Flow Rate

Fuel flow is calculated from the last 20 minutes of operation, and is subject to many uncertainties such as calibration, tank shape, sloshing, and so forth. Fuel flow is not calculated from a flow sender; the value provided is a computed guess. Do not use fuel flow rate for flight planning.

SETUP

Most users will set up the instrument once, then leave the settings unchanged. Setup is entered at power-up.

Entering Setup

1. With power off, press and hold the right-hand button.
2. While holding the right-hand button, turn the instrument power on.
3. When the setup screen appears, release the button.

Setup Navigation

Gesture	Action in Setup
Brief press LEFT	Decrease the displayed value; wraps at the end of the range
Brief press RIGHT	Increase the displayed value; wraps at the end of the range
Long press LEFT or RIGHT	Advance to the next setup row
Long press on the last row	Save settings and restart
Long press BOTH / center gesture where applicable	Shows COMMIT screen; hold RIGHT to save, hold LEFT to abandon
No activity for about 15 seconds	Shows COMMIT screen as a safety prompt; if no answer is given, setup exits without saving

Setup Rows

Row	Meaning
TANK	Choose DUAL or SINGLE tank display mode
UNIT	Choose GAL, LIT, or IMP display units
LCAP	Left tank capacity, entered in U.S. gallons with one decimal place. Adjusts in 0.5-gallon increments. The normal fuel display converts quantity to the selected display unit.
RCAP	Right tank capacity, entered in U.S. gallons with one decimal place. Adjusts in 0.5-gallon increments. This row is skipped in normal single-tank use.

CALIBRATION

Calibration teaches the RFGA how the installed sender and tank behave. Calibration is available on both the Resistive Fuel Gauge and the 0-5V Capacitive Fuel Gauge. The instrument does not require the sender to move in a particular direction; it accepts either increasing or decreasing readings as fuel level rises, as long as the captured values are monotonic.

Before Calibration

- The aircraft should be safely parked, level, and in a condition suitable for fuel handling.
- Use known fuel quantities. Calibration quality depends on the accuracy of the fuel added at each step.
- For a new installation, 5-point calibration is recommended. A 2-point calibration is faster but less able to correct tank shape or sender nonlinearity.
- For dual-tank aircraft, calibrate each tank separately.
- For single-tank installations, calibrate LEFT only. The RIGHT calibration table is not used in SINGLE mode.

Entering Calibration

1. With power off, press and hold the left-hand button.
2. While holding the left-hand button, turn the instrument power on.
3. When the CAL screen appears, release the button.

Calibration Navigation

Calibration Step	TAP either button	HOLD either button
TANK	Cycle LEFT / RIGHT tank	Advance to point count (PTS)
PTS	Cycle 2, 3, or 5 calibration points	Advance to point capture
PCT point (intermediate)	Capture live ADC and advance to next point	No effect

PCT point (last point)	Capture live ADC and commit; if validation passes, save and restart	No effect
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Recommended 5-Point Calibration

1. Power on the unit while holding the LEFT button to enter the calibration wizard.
2. At the TANK step, tap either button to cycle between LEFT and RIGHT tank. For a dual-tank installation, calibrate each tank in a separate calibration session. Hold either button to advance.
3. At the PTS step, tap either button to cycle through 2, 3, or 5 points. A 5-point calibration is recommended for new installations. Hold either button to advance to point capture.
4. The first calibration point is normally 0% / empty. Get the tank to that condition.
5. When the displayed live ADC reading is stable, tap either button to capture the reading and advance to the next point. The screen prefix "L" or "R" confirms which tank is being calibrated.
6. Add fuel to the next known percentage shown by the screen and tap again to capture.
7. **Continue until all points have been captured. The screen legend changes to "TAP TO COMMIT" on the last point.**
8. Tap to commit. If the captured points are valid (monotonic and complete), the new calibration is saved and the instrument restarts.
9. If validation fails, the screen lists all captured points with the points involved in the violation shown in red, followed by "ERROR NO COMMIT". Tap either button to return to normal operation. The previously stored calibration is preserved; no bad table is ever written to memory. Re-enter the calibration wizard to try again.

Calibration timing note: The calibration wizard does not time out. Fueling between points can take several minutes. To abandon calibration without saving, power-cycle the instrument; no calibration is written to memory unless a valid commit completes.

FACTORY RESET

Factory reset restores the instrument to its default configuration and default calibration. Use this only when intentionally clearing the stored configuration or when instructed by Radiant support.

1. With power off, press and hold both buttons.
2. Turn the instrument power on while continuing to hold both buttons.
3. Release the buttons when the RESET confirmation screen appears.
4. Tap the right button (OK) to confirm reset, or tap the left button (NO) to cancel. If no button is pressed within about 15 seconds, the unit returns to normal operation without resetting.
5. After a confirmed reset, the instrument restarts and installs default values.

TROUBLESHOOTING

Symptom	Likely cause / action
Resistive gauge shows OPEN	Sender wire is open, sender is not grounded, sender ground is poor, or the sender resistance is outside the expected measurable range. First verify sender ground.
Resistive gauge shows SHORT	Sender signal may be shorted to ground or wiring may be incorrect. Inspect sender wiring before flight.
Fuel level moves backward	The sender is reverse-acting. Run calibration; the RFGA accepts either polarity if points are captured in the displayed fuel-percentage order.
Capacitive gauge reads incorrectly	Verify sender output is a 0-5V analog signal and that sender ground and RFGA ground share a common reference. Do not connect bus voltage to the sender input.

Symptom	Likely cause / action
One tank displays correctly but the other does not	Check sender wiring, ground, and calibration for the affected side. White is left/single; orange is right. Confirm the instrument is in SINGLE or DUAL mode as intended.
Display too bright or too dim	Briefly press either front button in normal operation to cycle the internal brightness setting.
Calibration shows ERROR NO COMMIT	One or more captured points were not in monotonic order, or two consecutive points captured the same value. The failure screen lists all captured points with the offending points in red. The previous calibration remains in memory; no bad table is ever written. Re-run calibration, paying attention to the order of points and the stability of each capture.

DISCLAIMERS

Products from Radiant Technology are not designed to be used in applications where their failure would endanger safe flight or human life in any way.

They are intended solely for use in VFR conditions. They are not certified to meet any Technical Standard Order and are not produced under a Parts Manufacturing Authority (TSO / PMA). As a result, if installed in the aircraft, they are suitable only for use in experimental and ultralight aircraft, and in Light Sport Aircraft, if meeting the requirements of the respective manufacturer.

WARRANTY

Your new Radiant Technology instrument carries a three-year warranty from the invoice date. Please contact support@radiantinstruments.com should your product need warranty service. There is an additional charge for international warranty service.

RETURN / REFUND INFORMATION

Must be returned in new, uninstalled, resalable condition within 60 days after receipt. Ship to Radiant Technology, PO Box 20690, Wichita KS 67208.