

# FLYBOX®



**Fuel L-P**  
*(Omnia57-80 family)*

**Installation and User Manual, Safety  
Instructions and Warning Booklet**

**This product is not TSO'd and cannot be installed into  
traditional FAA Part 23 and similarly Type-Certificate Aircraft**

Document A2021FUEL L-P  
Revision#2.0, 04/2021  
For firmware version 1.9

This booklet is suitable for printing in A5 format.

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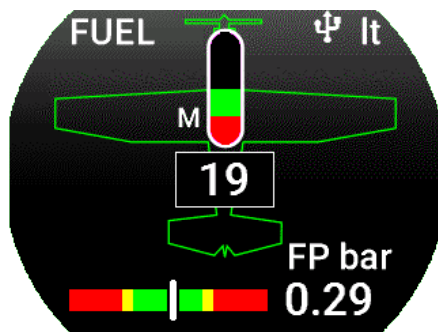
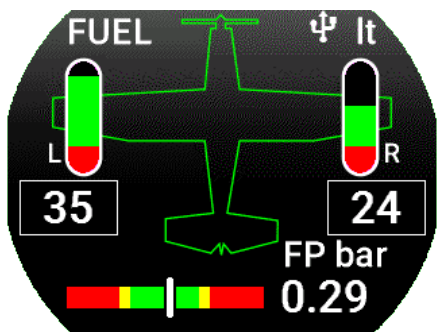
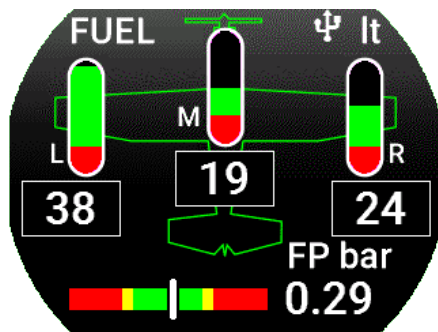
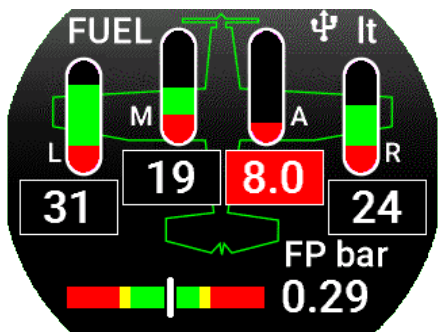
**OPERATING INSTRUCTIONS**

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# Examples of different configurations



Thank you for purchasing a Flybox<sup>®</sup> **Omnia** instrument.

**Omnia** instruments are available in 2 different formats, both with the same functionality:

**Omnia57** (2-1/8") and **Omnia80** (3-1/8").

This manual describes both formats.

Our intent in developing the **Omnia** instrument family was to create a light and compact product, powerful and easy to install and use.

The **Omnia** instrument family is equipped with a state-of-the-art highly visible display, a powerful 32 bit microcontroller and the latest generation of solid state sensors to ensure reliability and accuracy over time.

The owner has the possibility to keep the instrument software up-to-date by downloading the latest available revision from the [www.flyboxavionics.it](http://www.flyboxavionics.it) website and installing it using a USB pen drive.

We are confident our products will be satisfactory and will make your flying experience a pleasant one.

### **Symbols used in the Installation and User Manual, Safety Instructions and Warning Booklet**



**NOTE:** Used to highlight important information.

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**CAUTION:** Used to warn the user, it indicates a potentially hazardous situation or improper use of the product.

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**WARNING:** Used to indicate a dangerous situation that can cause personal injury or death if the instruction is disregarded.



**WARNING:** These instructions must be provided to users before use, and retained for ready reference by the user. The user must read, understand (or have explained) and heed all instructions and warnings supplied with this product and with those products intended for use in association with it. Always keep a copy of the Installation and User Manual, Safety Instructions and Warning Booklet on the aircraft. In case of change of ownership, the Installation and User Manual, Safety Instructions and Warning Booklet must be delivered together with all of the other papers.

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**WARNING:** Read the Installation and User Manual, Safety Instructions and Warning Booklet before installing the device on your aircraft and follow the procedure described therein.

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**WARNING:** This device is intended to be installed on NON-TYPE CERTIFIED AIRCRAFT ONLY, as it does NOT require any air operator's certificate. Refer to your national aviation authorities to check if this device can be installed on your aircraft.

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**WARNING:** It is the owner's responsibility to test this device before operating the aircraft and to make sure nobody is using it unless properly instructed and authorized to do so.

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**WARNING:** Once the installation process is completed, it is extremely important to test the device before taking off to make sure it works properly. Therefore, we strongly suggest to double check all of the electronic instruments available on the aircraft and to turn them on to verify they function correctly.



**WARNING:** This device is operated through a software which from time to time can be updated and/or subject to change. Please, always refer to the Installation and User Manual, Safety Instructions and Warning Booklet for the last updated version of the software available at [www.flyboxavionics.it](http://www.flyboxavionics.it)

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**WARNING:** It is the responsibility of the installer to properly install the device on the aircraft. In case of calibration, or any technical or functional customization of the device, the responsibility lies with the individual who carried out such operation.

FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY  
OR DEATH.

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**WARNING:** If this product is not used correctly, or it is subjected to additions or alterations, the effectiveness of this device may be considerably reduced.

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**WARNING:** Alterations, additions, or repairs not performed by the instrument manufacturer or by a person or organization authorized by the manufacturer shall negate any warranty.

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**WARNING:** Do NOT rely on the Omnia Fuel L-P device ONLY to determine the quantity of fuel available in the tanks.

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**WARNING:** The unit isn't waterproof. Serious damage could occur if the unit is exposed to water or spray jets.





**NOTE:** The consumer decides of his own free will if the purchased product is suitable and safe for his need. If the consumer does not agree with the notices contained in this Installation and user Manual, Safety Instructions and Warning Booklet, do not install this instrument in his aircraft.

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**NOTE:** Flybox Avionics reserves the right to change or improve its products as well as terms, conditions, and notices under which their products are offered without prior notice.

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**NOTE:** The Installation and User Manual, Safety Instructions and Warning Booklet will be updated annually if needed.

All changes or updates will be published on our website [www.flyboxavionics.com](http://www.flyboxavionics.com) in the "support" section.

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**NOTE:** Check the website [www.flyboxavionics.it](http://www.flyboxavionics.it) periodically for software and manual updates.

For some products, registration may be required to receive important news or information on available firmware updates or to receive security information.

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## **OMNIA FAMILY SYSTEM OVERVIEW**

The **Omnia57-80** instrument family has many innovative features, common to all models as described below.

### **1.1 CONSTRUCTION FEATURES**

**Omnia** instrument family is built from solid aluminum alloy, CNC milled and powder coated to last a long time over the years always showing a new appearance.

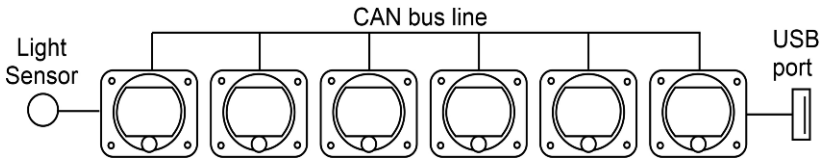
### **1.2 ERGONOMICS**

- Large 2.4 inch (57), 3.5 inch (80), TFT display, 320x240 Pixels, 1000 nits, antiglare surface, sunlight readable, wide temperature range.
- A high quality knob encoder with push button for easy access to all features.
- Backlight auto dimming feature with one optional sensor for all the Omnia57 installed in the panel.

### 1.3 INTERCONNECTION ABILITY

All the instruments of the **Omnia** family can be connected together via CAN1 to form a communication network, making some data exchange operations simpler.

The software update of a **Omnia** instrument connected in group takes place through the CAN1 bus communication with the instrument that has the USB pen drive connected. This means that the USB connection is made to a single instrument, and the information will be forwarded via CAN bus to or from all the others in the group. **Omnia57** and **Omnia80** instruments can be mixed on the same CAN1 bus.



Up to 16 Omnia can be connected together through the CAN 1 bus.

The configuration data and the data logger of the interconnected instruments are saved or restored via CAN1 bus on the same USB pen drive. A single brightness sensor can provide information to all the connected instruments to automatically adjust the backlight intensity.

## **1.4 EASY SOFTWARE UPDATE**

The user can download any new firmware, when available, from Flybox website, connect a USB pen drive to the instrument and freely update it with the last features.

With one USB connection only, it will be possible to update every instrument installed in the panel. If more **Omnia** are installed and properly connected, they will search for the right firmware through the CAN1 bus.

## **1.5 EASY DATALOG SAVING**

Easy logging of the data for debug purpose. If needed, each **Omnia** unit can save a last flight log on the USB pen drive. The user can then send the log via e-mail to Flybox support for a help/support request.



**NOTE:** for easy access to the USB port, it is recommended to install a USB extension cable in one of the **Omnia** instruments and store the free connection in an easily accessible part of the dashboard. It is not recommended to use extension cords longer than 50 CM.

## 1.6 INTERFACES

All the **Omnia** instruments have the following common interfaces:

**2 separate CAN BUS:** CAN1 bus is used to connect the **Omnia** instruments together, CAN2 bus is used to interface them with other Flybox instruments or with external devices like Engines ECUs or new devices to be developed in the future.

**2 RS232 serial ports:** used to connect the **Omnia** instruments to an external GPS (when applicable). This feature appears in some models only.

**1 Sensor Light Input:** if connected, it allows the automatic backlight intensity adjustment, one sensor for all the instruments connected in the same CAN bus.

**2 Power outputs for sensors:** one 12 V 500mA@60°C and the other 5 V 350 mA@60°C, both protected from short circuit.

If the current on one of the outputs is too high, a caution message will appear.

**Caution!**  
High current PIN 2

**1 Alarm output:** all the **Omnia** instruments can activate an external warning device like a lamp or a small relay through this NPN transistor output.

## ***MECHANICAL INSTALLATION***

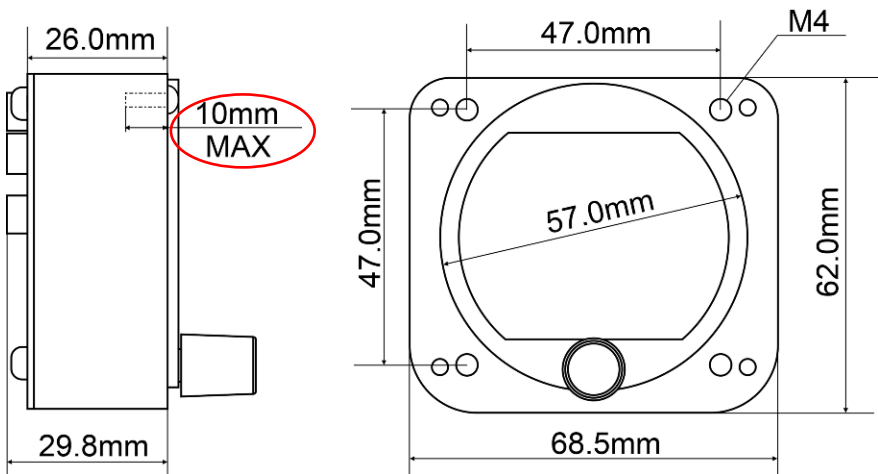
It's recommended to choose a position that permits optimal display visibility. The instrument is supplied with four M4 screws to install it to the panel, if you use other screws consider that the maximum thread length inside the instrument body is 10mm (see the picture below).

Damage to the instrument due to the use of a screw longer than the permitted length will not be repaired under warranty.



## 2.1 OMNIA57 MECHANICAL DIMENSIONS

The **Omnia57** instrument fits in a standard 2 ¼" (57 mm) panel cutout.



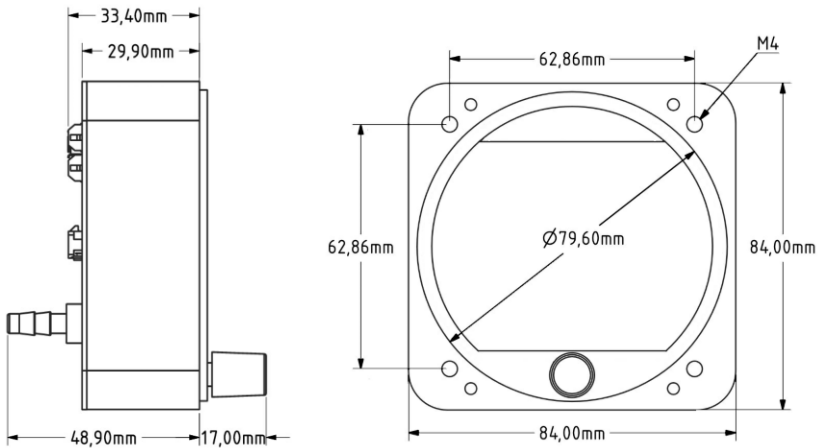
**CAUTION:** The maximum screw length inside the instrument body is 10mm.



**NOTE:** For an installation without interference, consider making a hole of at least 57.5 mm diameter.

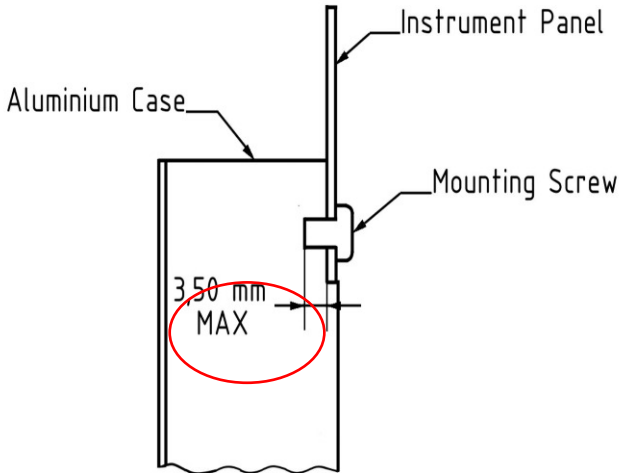
## 2.2 OMNIA80 MECHANICAL DIMENSIONS

The **Omnia80** instrument fits in a standard 3 1/8" (80 mm) panel cutout.



**NOTE:** For an installation without interference, consider making a hole of at least 80.5 mm diameter.

### 2.3 OMNIA80 Max screw length



The screws supplied (M4x6mm), are suitable for panel thicknesses between 1.5 mm and 2 mm.

Flat nylon washers are also supplied with the screws for use with very thin panels.



**CAUTION:** The maximum screw length inside the instrument body is 3.5mm.

Using screws that are too long will damage the display and cannot be repaired under warranty.

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## **2.4 FUEL LEVEL SENSORS INSTALLATION**

**Omnia Fuel L-P** has 4 fuel level inputs that can be connected to both resistive sensors (with max resistance of 300 ohm) and capacitive sensors (with output voltage range 0~5 Volt).

Resistive sensors can be of two types, both supported by the device: resistive sensors that increase resistance as you add fuel and resistive sensors that decrease resistance as you add fuel. If you don't know what type of sensors are installed please see chapter 4.7 "Fuel level sensors checkings".

It's also possible to install a mixed type of sensors (i.e. 2 resistive + 2 capacitive).



**CAUTION:** All fuel level sensors connected to the **Omnia Fuel L-P** must not be connected to any other instrument.

Disconnect any previously used instrument.

## **2.5 IMPORTANT CONSIDERATIONS**



**NOTE:** Be advised that many fuel level sensors might not be able to accurately measure the capacity of the tank and that one of the following issues might occur (please, see chapter 2.2 “Fuel level sensors installation”):

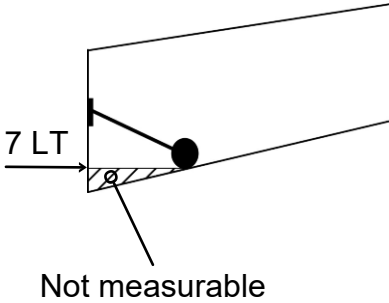
In the example of **pic.1** of next page, a tank contains 7 litres but the fuel sensor cannot measure that lower part of the tank, so **Omnia Fuel L-P** will display "0" (zero) for a fuel level of 7 litres or less.

In the example of **pic.2** of next page, a tank can hold 50 liters of fuel but at 35 liters the fuel sensor is at his upper position, the maximum quantity that **Omnia Fuel L-P** will display is 35 liters.

The first situation described above, or the second one, or both, can occur very often, especially for tanks installed in the wings due to the angle of dihedral.

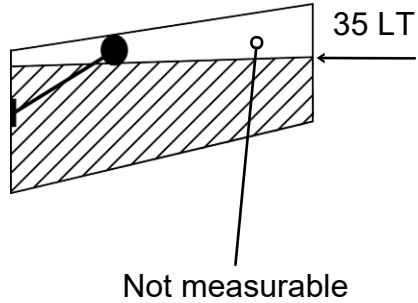


**NOTE:** If your fuel sensor is not able to measure the fuel level from empty to full, while planning your flights, you may need to keep in mind the amount of fuel that the instrument is unable to measure. Keep in mind that this can happen even with an analog indicator, where the sensor can not measure, the instrument can not give



**Pic.1**

It takes a considerable amount of fuel before the sensor starts moving when adding fuel to an empty tank.

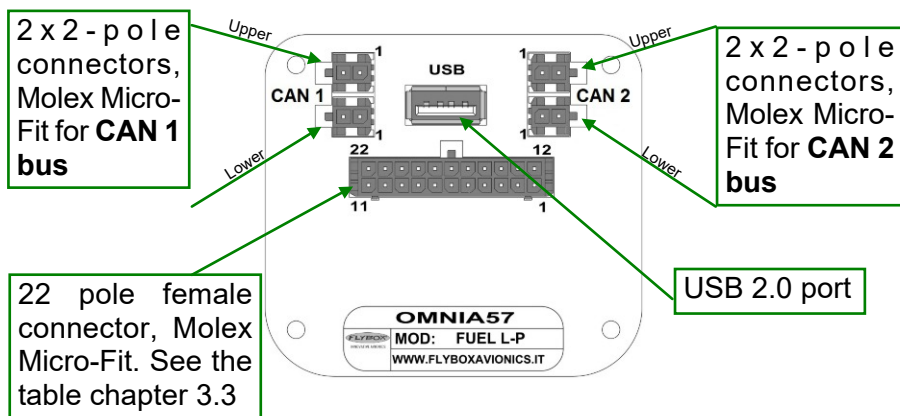


**Pic.2**

It takes a considerable amount of fuel before the sensor starts moving from the top when draining fuel from a filled up tank.

## ELECTRICAL INSTALLATION

### 3.1 REAR PANEL CONNECTIONS



The required connectors and terminals are supplied with the instrument.

The manufacturer's codes are:

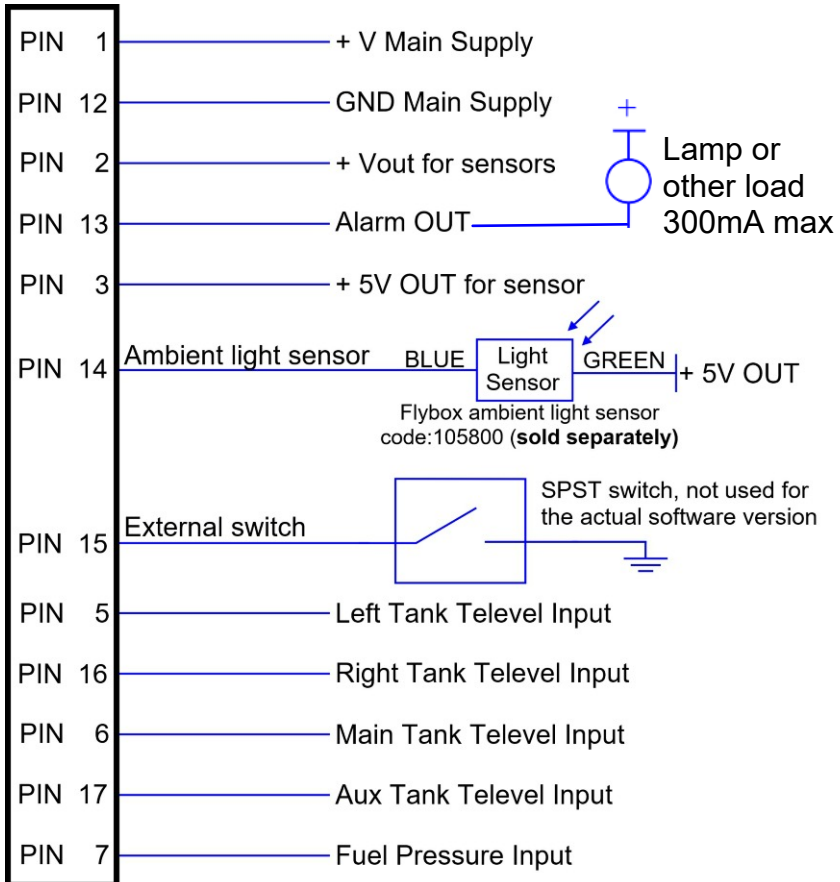
- Molex P/N 43025-0200 (2 pole housing)
- Molex P/N 43025-2200 (22 pole housing)
- Molex P/N 43030-0007 (female crimp terminal)

The terminals can be crimped with:

- Flybox Professional Crimping Tool cod. 603000
- Molex tool P/N 63819-0000

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Safety Instructions and Warning Booklet

### 3.2 - (22 POLE) FEMALE CONNECTOR WIRING



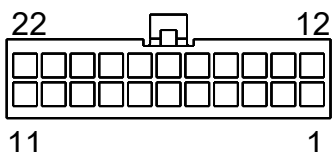
**⚠ WARNING:** Voltage peaks on the supply line exceeding the operating limits can damage the device.

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 Safety Instructions and Warning Booklet



**3.3 - (22 POLE) CONNECTOR TABLE**

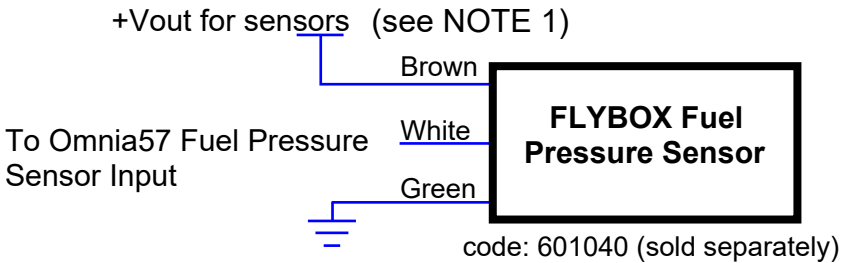
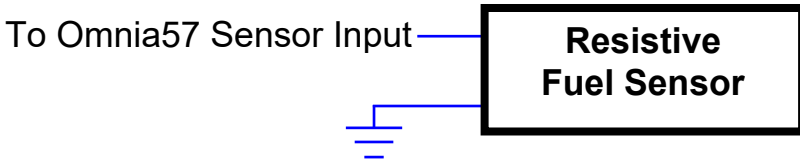
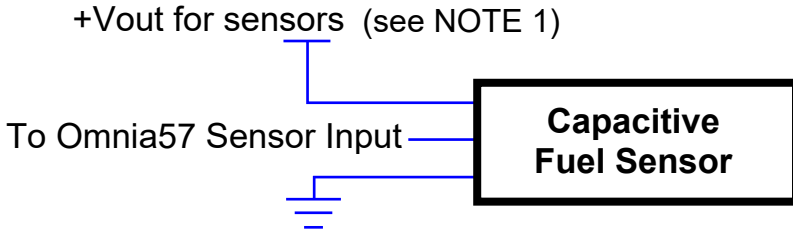
PIN	I/O	Signal
1	I	+V Main supply, 10-30Vdc, with a proper breaker, see note1
2	O	Vout for sensors, it delivers the same voltage supplied on the Pin 1, short circuit protected and limited to 500mA
3	O	5V out for sensor, short circuit protected and limited to 350mA
5	I	Left tank sensor input
6	I	Main tank sensor input
7	I	Fuel Pressure input
12	I	GND main supply
13	O	Alarm Out, NPN 300 mA (not protected)
14	I	Ambient light sensor input
15	I	External switch
16	I	Right tank sensor input
17	I	Aux tank sensor input



Molex P/N 43025-2200 (22 pole housing). View from wire insertion side.


Note1: Since the current consumption is 60mA, consider a breaker of 1A or less.

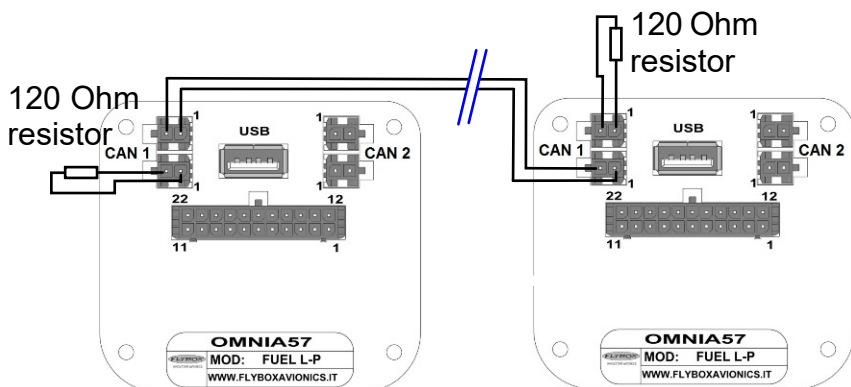
### 3.4 SENSORS ELECTRICAL CONNECTIONS



**NOTE 1:** use sensors which support the voltage supplied to PIN 1 only.

### 3.5 CAN BUS CONNECTION WIRING

Pin 2  Molex P/N 43025-0200 (2 pole housing). View from wire insertion side  
 Pin 1



### CAN bus Wiring Information

The basic electrical architecture of a CAN bus consists of a single twisted or shielded wire pair with a device connected at each end. Each end must be terminated with a 120 ohm resistor, Flybox code 105810. Up to 16 Omnia can be connected together through CAN 1 bus.

Ready-made termination resistors and wiring for connecting several Omnia together are available in different lengths: 25cm, 50cm, 100cm.

See the website [www.flyboxavionics.it](http://www.flyboxavionics.it) for details and how to order.

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 Safety Instructions and Warning Booklet

### 3.6 - (2 POLE) CAN BUS CONNECTOR TABLES

#### 2 Pole CAN 1 Upper Connector

PIN	I/O	Signal
1	I/O	<b>CAN 1 H</b> Internally connected with the Pin 1-CAN 1 H (Lower connector)
2	I/O	<b>CAN 1 L</b> Internally connected with the Pin 2-CAN 1 L (Lower connector)

#### 2 Pole CAN 1 Lower Connector

PIN	I/O	Signal
1	I/O	<b>CAN 1 H</b> Internally connected with the Pin 1-CAN 1 H (Upper connector)
2	I/O	<b>CAN 1 L</b> Internally connected with the Pin 2-CAN 1 L (Upper connector)

#### 2 Pole CAN 2 Upper Connector

PIN	I/O	Signal
1	I/O	<b>CAN 2 L</b> Internally connected with the Pin 1 CAN 2 L (Lower connector)
2	I/O	<b>CAN 2 H</b> Internally connected with the Pin 2 CAN 2 H (Lower connector)

#### 2 Pole CAN 2 Lower Connector

PIN	I/O	Signal
1	I/O	<b>CAN 2 L</b> Internally connected with the Pin 1 CAN 2 L (Upper connector)
2	I/O	<b>CAN 2 H</b> Internally connected with the Pin 2 CAN 2 H (Upper connector)

## INSTRUMENT SETTINGS

### 4.1 MINIMUM SETTINGS BEFORE FIRST USE



**CAUTION:** Before using Omnia Fuel L-P in flight, you must set the following parameters as explained in the instructions on the following pages and in this sequence:

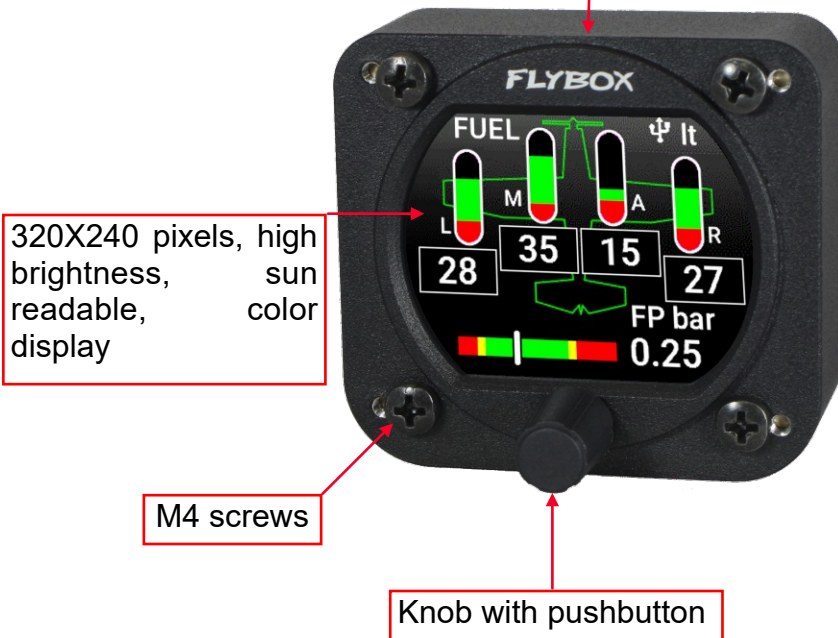
1. Set the unit of measure: US gallons or liters (**set this before all the other parameters**).
2. Enable the tanks installed in your aircraft only and let disabled all the other tanks.
3. Set all the “Reserve” value for the enabled tanks, thresholds and alarm parameters for the fuel pressure gauge, if enabled.
4. Set the fuel sensor type for every enabled tanks (resistive+ / resistive- / capacitive).
5. Execute the calibration procedure for all the enabled tanks.
6. If a fuel pressure sensor is installed set all the parameters in the “Fuel Pressure” Submenu.
7. Check if the indications are correct for all the enable tanks.



**WARNING:** In the absence of the above operations, or if they are not performed correctly, you can not consider as reliable the indications of the instrument.

## 4.2 PANEL INDICATORS & COMMANDS

57mm (2-1/4") or 80mm (3-1/8") aluminium enclosure



The knob can be rotated to select the functions and increment or decrement the values while pressing it to confirm.

### **4.3 SETUP MENU NAVIGATION**

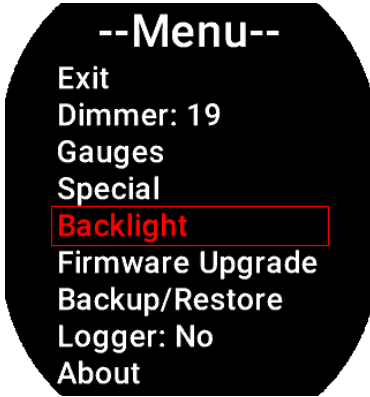
Navigation through the menus is very simple and fast using the knob:

- Press the knob for 1 second to enter in the Setup Menu. The menu automatically disappears if you don't press or rotate the knob for 5 seconds.
- Rotate the knob to navigate through menus and submenus items.
- The setup system is organized in menus and submenus; a submenu is a term used to describe a menu that is contained within another menu.
- Press the knob to enter in the selected item.
- The knob can be rotated to select the functions and increment or decrement the values while pressing it to confirm. To exit without changing while editing a number or multiple choice, keep pressed the knob for 3 seconds.
- The first items on every menu are Exit or Back. "Exit" is used to quit the Setup and go directly to the main screen, "Back" is used to go back to the previous level.



Edited data are saved when returning to the main screen. If you turn off the instrument while inside a menu, your changes will be lost.

### 4.4 MAIN SETUP MENU



**Exit:** confirm to “exit” from the setup menu and go back to the main screen.

**Dimmer:** adjust display brightness from 1 (min brightness) to 19 (max brightness). Default value=19. The adjustment works in Manual mode only.

**Gauges:** select to set the 4 tanks gauge setup and the fuel pressure gauge setup. Go to chapter **4.4.1** for a full description.

**Special:** enter to restore the default settings. **Caution:** This operation returns the instrument to the factory settings. All settings, except calibration data, will be erased. **It will require double confirmation.**

**Background:** select which background you prefer between “faded” and “dark”.



**Backlight:** set the backlight in “Manual” or “Automatic” mode. Go to chapter **4.6** for a full description.

**Firmware Upgrade:** enter to upgrade the firmware. Go to chapter **5.1** for a full description.

**Backup/Restore:** enter to save and load settings. Go to chapter **5.2** for a full description.

**Logger:** enable to save a flight session data. Go to chapter **5.4** for a full description.

**About:** enter to see instrument information.



About Page Example

### 4.4.1 Gauges Submenu



**Back:** confirm to go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Televels:** enter to setup the 4 fuel tank gauges. Go to chapter **4.4.2** for a full description.

**Fuel Pressure:** enter to setup the Fuel Pressure gauge. Go to chapter **4.5** for a full description.

### 4.4.2 Televels Submenu



**CAUTION:** The Unit parameter must be selected before calibration and then must not be changed, otherwise the calibrations made will no longer be valid.

**Back:** confirm to go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Unit:** set the unit of measure in liters (**It**), US Gallons (**gal**) or Imperial Gallons (**imp**). Default = **It**.

**Filter:** increase the number if the reading is affected by noise on the input signal, decrease the value if the reading is delayed related to the input signal.

Default = 10, Min = 1 (faster), Max = 100 (slower)

**Qty Step:** set the fuel quantity to add at each calibration step. Range in liters: 1~20 with increment of 1; Range in Gallons: 0.1~5.0 with increments of 0.1. The currently selected unit of measurement is indicated in brackets after the label as follows: **Qty Step(lt)** or **Qty Step(gal)**. Changing the unit of measure will reset the **Qty Step** value if already set.

Choose a proper value considering the tank capacity and how many calibration step you want to execute.

For example, with a 40 liters tank and "**Qty Step**" set to 4,  $40/4 = 10$  calibration steps will be required. The maximum number of calibration steps is 50.

The "**Qty Step**" parameter is used for all the 4 tanks calibration, don't modify it once you have choosed a value.

The calibration ends when the tank is completely filled.

**mV Step:** minimum thresold to detect fuel sensors movement. Default = 20. Don't modify this value.

**Main Tank:** set the Main Tank parameters. Go to chapter **4.4.3** for a full description.

**Aux Tank:** set the Aux Tank parameters.

**Left Tank:** set the Left Tank parameters.

**Right Tank:** set the Right Tank parameters.

### 4.4.3 Main Tank Submenu



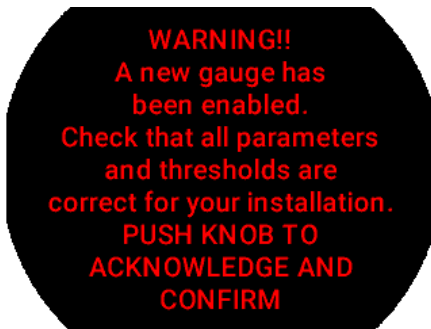
**Back:** go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Enable:** select “Yes” to enable this Tank, select “No” to disable this Tank.



**NOTE:** Each time a new gauge is enabled this message will appear to remind the installer that it is his responsibility to make the correct settings before continuing.



Push and accept to continue.

**Sender Type:** set the proper fuel level sensor type installed in the Main Tank.

The supported type can be:

RES+ for resistive fuel sensors that increase resistance as you add fuel.

RES- for resistive fuel sensors that decrease resistance as you add fuel.

CAP for capacitive with output between 0 and 5 volts.  
If you don't know what type of sensors are installed, please see chapter 4.7, Fuel level sensors checkings.



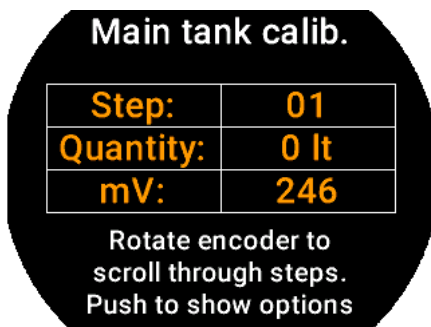
**NOTE:** It's also possible to install a mixed type of sensors (i.e. 2 resistive + 2 capacitive).

**Res:** Set the value of the reserve at a level where the instrument will give the alarm. When the remaining fuel reaches this setpoint, the instrument activate the output alarm (Range 0~calculated capacity after calibrated). An alarm message will also appear on the screen; the message can be reset by pressing the knob but the background of the number remains red. To disable this

**Calibration:** enter to calibrate the Fuel Sender of this Tank. With the calibration process, **Omnia F-P** learns the shape of your Tank and correct some errors like non-linearity of the Fuel Sensor and tolerance. Go to chapter **4.4.4** for a full description.

**Alarms:** select to set an alarm for this tank. Go to chapter **4.4.5** for a full description.

#### 4.4.4 Main Tank Calibration



**NOTE:** if no calibrations have been made for this tank, a message indicating that there are no calibration data will appear.



**NOTE:** Calibration must be performed with the aircraft in flight attitude so you will need to raise or lower the tail depending on whether it is, a taildragger or a tricycle.

Empty the tank so that only the unusable fuel remain in the tank.

To reach the maximum accuracy in the calibration, It's important that the fuel quantity is exactly measured.

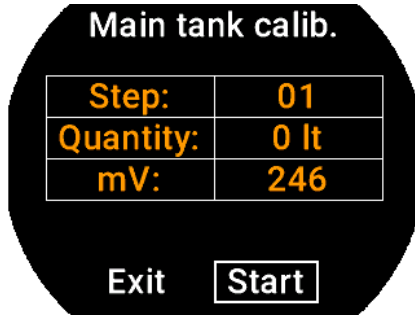
A good practice to make the float stabilize on the fuel is to give a shake to the plane. This can sometimes overcome the friction of some floats that tend to be sticky.

Calibration is divided into several calibration steps, in each step a predetermined amount of fuel (x liters) will be added to the tank.

After confirming the calibration function, the screen above will appears.

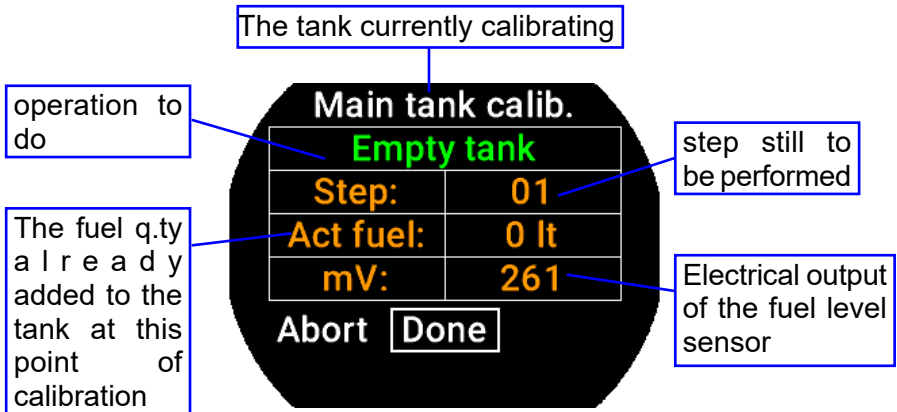
If this tank had already been calibrated before, turn the knob to see all the values stored in the various steps. If it has not yet been calibrated or if you want to repeat the calibration process, press the knob to display the menu in the following figure.



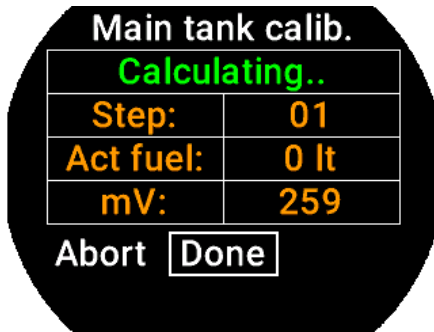


Confirm Exit to exit calibration.

Confirm “Start” to start a new Calibration, this screen will appear.



**Step 1:** Check that the tank is empty, wait for the mV indication to be stable and **confirm “done” before to proceed to the next step.**



At this step the actual fuel is 0 lt.

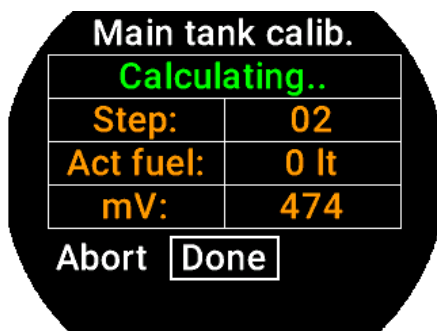
After “Done” is confirmed, the microcontroller will calculate the mV average value for few seconds, then the screenshot below will appear. Now you are ready for the next step.



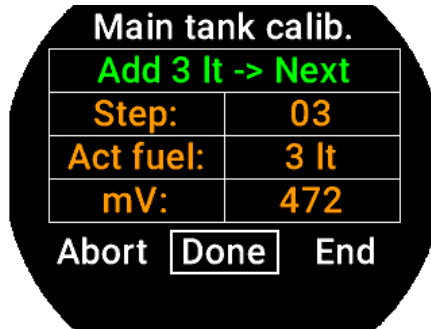
In the example, the “Qty Step” value is set to 3 liters.

**Step 2:** Now add the fuel indicated in the green field (it's the same quantity chosen in the "Qty Step" parameter).

**Step 3:** Wait for the new mV indication to be stable and proceed to the next step by confirming "Done". If there are no problems in your system, what you'll see is the following.



The microcontroller will calculate the average value for few seconds, during which you will see the screenshot above, before moving on to this screenshot of the next page.



**Next steps:** repeat step #2 and step #3 until tank is completely filled. When the tank is filled: click on “DONE” to confirm the last calibration step and then click on “END” to end the calibration. You will be asked for a confirmation.



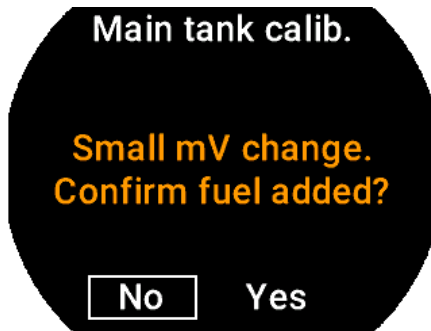
**NOTE:** A common problem for many fuel level sensors is that they can't completely measure the tank capacity, so one or both of this conditions can occur (see also chapter 2.2 “Fuel level sensors installation”):

- As you add fuel to an empty tank it takes a certain amount of fuel before the fuel sensor starts moving from the bottom.
- As you drain fuel to a filled tank it takes a certain amount of fuel before the fuel sensor starts moving from the top.

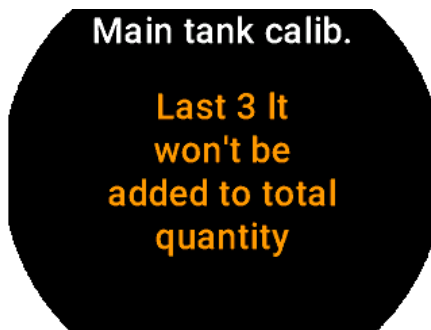


**NOTE:** This is not a problem of the instrument but a situation that can occur if the sensor travel does not cover the entire fuel travel from botton to top.

If one of these conditions occurs during the calibration, **Omnia F-P** notices that the fuel sensor doesn't produce an electrical change and asks the user if fuel is already added for that calibration step:



If you are sure to have already added the fuel, confirm on "YES" otherwise click on "NO" to go back to previous calibration step.





**NOTE:** Consider that all fuel additions that will not give any sensor movement will not be counted.

Follow the instructions given for the **Main Tank** setup Chapter 4.4.3 for the other fuel tanks, **Aux Tank**, **Left Tank**, **Right Tank**.

### 4.4.5 Alarms:



**Back:** go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Warning:** select “Yes” to enable or select “No” to disable the “Res” alarm output.

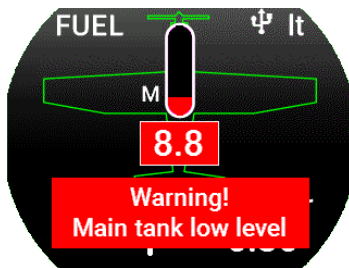
**Act delay:** Select a delay in seconds before the alarm is triggered. When the reserve value is reached, the alarm output will be activated after the set time. This option can be useful to avoid continuous alarms when the fuel reaches quantities close to the set reserve value.

Default = 0s

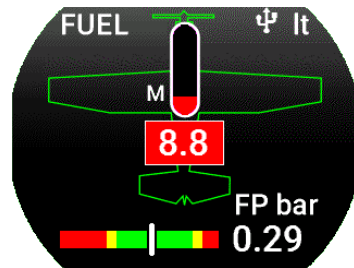
Min = 0s (faster)

Max =10s (slower)

The alarm is only triggered if the Warning parameter is set to "Yes". The alarm event triggers both the flashing message on the screen and the alarm output. Both can be reset by pressing the knob but the rectangle behind number remains in red.



Before resetting

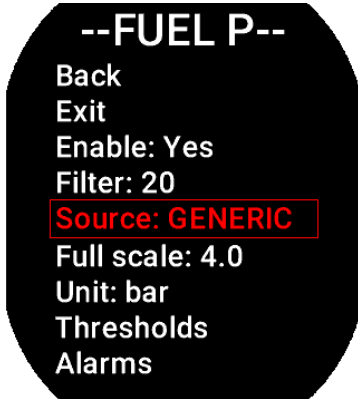


After resetting with the knob

(the example shows a setting of only one tank)

Follow the instructions given for the **Main Tank** alarm setup for the other fuel tanks, **Aux Tank**, **Left Tank**, **Right Tank**.

### 4.5 Fuel Pressure submenu



**Back:** go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Enable:** set “Yes” if the Fuel Pressure sensor is installed, “No” if it isn’t installed.

**Filter:** increase the number if the reading is affected by noise on the input signal, decrease the value if the reading is delayed related to the input signal.

Default = 20, Min = 1 (faster), Max = 100 (slower).

**Source:** select here the source for the Fuel Pressure readings; the available sources are:

Generic, is used for sensors of other brands which have an output signal of 0.5V to 4.5V. When selecting Generic, a **Full scale** parameter also appears where you can set the sensor’s full scale value in the selected unit.

FBX, to read the data from a Fuel Pressure sensor if connected. Optional Flybox code: 601041



912iS and 915iS, to read the data from the Rotax CAN bus. In order to have the correct pressure with these engines it will be necessary to also install the sensor Flybox cod. 601041

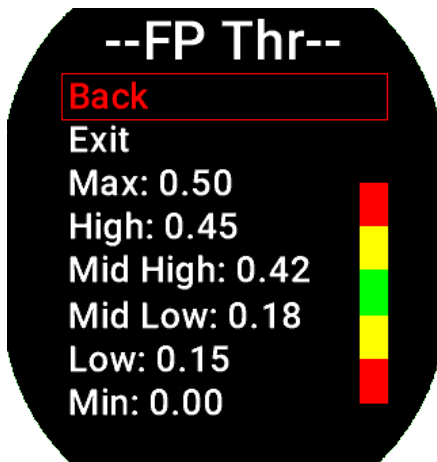
ULP125, ULP500, ULPower engines CAN bus

KAV15PSI, from Kavlico

**Unit:** Select “bar” or “psi”, default is “bar”



**NOTE:** Each time the unit is changed, the full scale value is reset to zero, so it needs to be reinserted.



**Thresholds:** set all the thresholds for the Fuel Pressure gauge.

Rotate the knob to highlight the threshold you want to change, push and change the value, push again to confirm. Default thresholds are at 0.

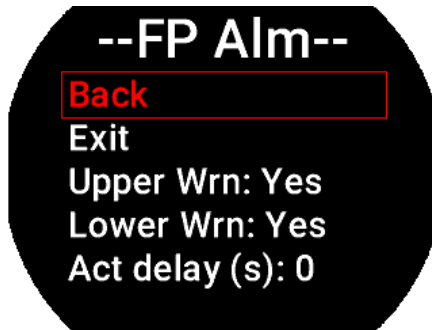


**NOTE:** Start to change the maximum thresholds and then, gradually, the lower thresholds.



**NOTE:** To make a colored portion disappear, give the same value to the low and high thresholds of that color.

**Alarms:** enter to go in the Fuel Pressure Alarm menu.



**Back:** go back to previous menu.

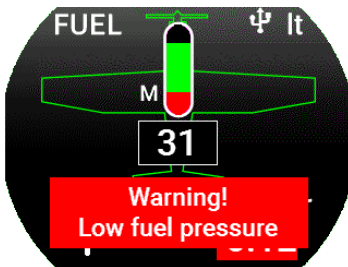
**Exit:** confirm to go directly to the main screen.

**Upper and Lower Warning:** select “Yes” to enable or select “No” to disable the upper and the lower alarm output.

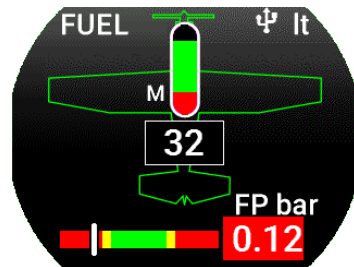
**Act delay:** Select a delay in seconds before the alarm is triggered. When the Low or the High thresholds are reached, the alarm output will be activated after the set time. This option can be useful to avoid continuous alarms when the fuel pressure is stationary at values close to the set threshold.

Default = 0s  
Min = 0s (faster)  
Max = 10s (slower)

The alarm is only triggered if the Warning parameter is set to "Yes". The alarm event triggers both the flashing message on the screen and the alarm output. Both can be reset by pressing the knob but the rectangle behind number remains in red.



Before resetting



After resetting with the knob

(the example shows a setting of only one tank)

## 4.6 Backlight Submenu



**Back:** go back to previous menu.

**Exit:** confirm to go directly to the main screen.

**Mode:** select to choose between “Manual” and “Auto”. When in “Manual” mode, the brightness can be changed with the dimmer function from the main menu, from 1 (min brightness) to 19 (max brightness). Default value=19.

Selecting “Auto”, 3 new parameters will appear in the list



**Source:** choose "Sens" to read the brightness from the optional sensor connected to the instrument itself or "CAN" to read the ambient brightness from the CAN1 bus if the brightness sensor is connected to another **Omnia** instrument connected in cluster.

In the case of 2 or more instruments connected in cluster via CAN1 bus, set "Sens" only on the instrument to which the sensor is connected and set "CAN" in all others.

**Smoothness:** choose how fast the backlight changes when there is a variation of light on the sensor.

Default= 1

Min= 1 (faster)

Max= 3 (slower)



**NOTE:** If the mode function is set to AUTO, during a software update and when performing a backup/restore, the light automatically switches to MANUAL mode during that operation.

**Min light(%):** choose minimal backlighting when the environment is dark.

Default= 1

Min= 1 (dark)

Max= 20 (bright)



**NOTE:** if you upgrade to this backlight version for the first time due to a firmware update, the backlight menu items will be reset to their default values. Re-adjustment of the "Smoothness" and "Min light" parameters may be necessary.

## **4.7 FUEL LEVEL SENSORS CHECKINGS**

To setup the **Omnia Fuel L-P** correctly, you need to know what type of fuel level sensors are installed in your aircraft. The resistive sensors can be of two types:

- Sensors that increase resistance as the fuel level increase.
- Sensors that decrease resistance as the fuel level increase.

If you don't know what type of resistive sensors are installed in your aircraft, follow this procedure:

- Empty the tank that you want to check.
- Enter in the calibration for that tank
- From the screen that appears annotate the numerical value indicated in the field mV
- Add a certain amount of fuel to the tank and check if the numerical indication increases or decreases: if increases then the sensors installed increase the resistance as you add fuel (RES+), if it decreases the sensors decrease the resistance as you add fuel (RES-).

To exit from the calibration screen turn select and confirm "Abort" and then "Exit".

Repeat the procedure for any other unknown sensors installed.

## OPERATING INSTRUCTIONS

### 5.1 FIRMWARE UPGRADE

The software can be easily updated with new versions, when available. It is advisable to regularly check for new versions on [www.flyboxavionics.it](http://www.flyboxavionics.it) > support > software page.

Download the new version and after unpacking it, copy it to a USB stick, possibly free from other files.

To update the instrument it is necessary to connect the USB stick to the instrument you want to update or to any other instrument of the Omnia series installed and clustered via the CAN bus, following the procedure below:

- connect the usb stick to the instrument
- From the main menu of the instrument you want to upgrade select “Firmware Upgrade”.

If the USB stick is not yet plugged-in, a message advising you to insert it will appear:





If already plugged-in, a message indicating the file and the version will appear:



Select and confirm the software you want to write, the following screen will appear:



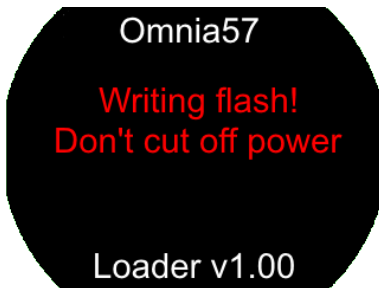
In case you are installing a version prior to the installed one, a different message will inform that you are **downgrading** and not upgrading the software. Confirm “Yes” to proceed, “No” to exit without writing any software.

(DEV. NAME) is the name of the instrument being update.

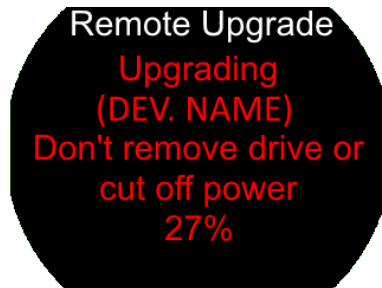
Wait until this message will appear and then remove the USB stick. The instrument will reboot with the new software.



**Note:** if the USB stick is installed on a device other than the one you are updating, the following messages will appear on the 2 devices:



Device is being Update



Remote device where the USB is connected

## 5.2 Backup / Restore

All set parameters and calibrations made in the instrument can be saved in a backup file. This can be useful if you need to restore all the parameters in a new instrument, for example in case of replacement, or if you need help from the instrument manufacturer. In this case, simply send the backup file saved on the USB stick to the Flybox support service. To backup or restore the parameters it is necessary to connect a USB stick to the instrument you want to backup/restore or to any other instrument of the Omnia series installed and clustered via the CAN bus.

From the main menu of the instrument you want to backup or restore the parameters, choose “Backup/Restore”. If the USB stick is not plugged-in yet , a message advising you to insert it will appear



Select “Backup” and push the knob to write the file on the USB stick. When the file is written, this message will appear:



Select “Restore” and push the knob to load the previously saved parameters into the instrument.



Push the knob to reboot, the new parameters are now loaded in the instrument.

### 5.3 USE OF THE INSTRUMENT

When switched-ON, the display will immediately show the main page with the enabled gauges.

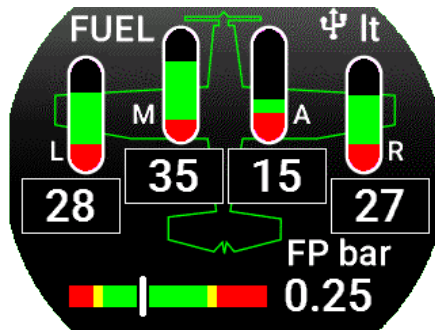


**NOTE:** The first time you switch-ON the **Omnia F-P**, there will not be enabled tanks. You need to enable and calibrate the tanks as explained in chapter 4.4.3.

The fuel pressure gauge will not be enabled too, so if you have the fuel pressure sensor installed, enable it as explained in the chapter 4.5.

The example below refers to the installation comprising of four tanks and the fuel pressure gauge; if your aircraft has less than 4 tanks, the indication of the display might be different. The tanks are named:

**L** (left), **M** (main), **A** (auxiliary), **R** (right).



When the fuel in a single tank drops below the relative reserve setpoint (see chapter **4.1**), **Omnia F-P** activates an alarm warning as explained in the chapter **4.4.5**.

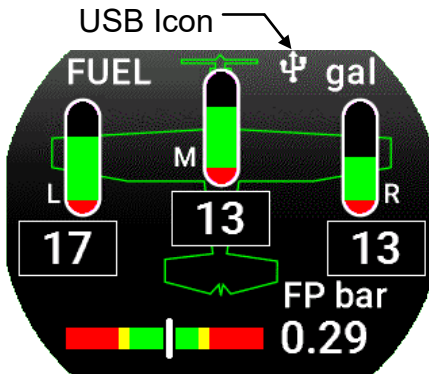
Pushing the knob will reset the alarm but note that the rectangle behind number remains in red.

## 5.4 Logger

The Logger can be useful for storing flight data on the USB stick, for example to ask for assistance in case of problems.

The data will be stored at 1 second samples and written on a file with some information of the instrument that generated them.

When the USB flash drive is plugged-in to the device to be logged or to any other instrument of the Omnia series installed and clustered via the CAN1 bus, a white icon will appear on the display indicating that the flash drive is connected.



To activate the Logger choose “Yes” from the Main Menu>Logger. The icon will turn **green** when the file is being written and **red** when the Logger is enabled but the USB stick is not connected or in case of writing problems.



**NOTE:** If several instruments are connected on the same CAN1 bus, the Logger can only be activated on one instrument at a time. The Logger function will automatically switch off each time the instrument is switched off.

## **TECHNICAL SPECIFICATIONS**

- Graphic TFT LCD with backlight and coated glass, dimensions 29x18mm.
- Standard mounting 2-1/4" 57mm and 3-1/8" 80mm.
- Powder painted aluminium case.
- Dimensions: 68x62x35mm (57), 85x85x40mm (80).
- Weight: 140g. (57), 230g. (80)
- 4 fuel level sensors input for resistive (300 ohm max) or capacitive (0~5 Volt) sensors.
- Supply voltage: 10 ~ 30 V=.
- Supply current: 60mA (57), 135mA (80).
- Open-collector alarm output (max 300mA, active low). This output can also be used to send a tone in the intercom, using the Flybox optional device code 105899.
- Operating temperature range: -20 ~ +70°C.
- Humidity: 90% max (without condensation).
- Communication through 2 CAN bus.
- USB port: for USB 2.0

## **CLEANING**

The screen is very sensitive to some cleaning materials and should be cleaned with a clean, damp cloth only.



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## **One Year Warranty:**

Product support and warranty information can be found at [www.flyboxavionics.it](http://www.flyboxavionics.it).

**Flybox®** warrants this Product to be free from defects in materials and workmanship for 12 months from date of delivery. The inactivity of the Products determined by periods of repair does not involve the extension of the warranty period.

This warranty covers only defects in material and workmanship found in the products under normal use and service when the product has been properly installed and maintained. This warranty does not cover failures due to abuse, misuse, accident, improper maintenance, failures to follow improper instructions or due to unauthorized alterations or repairs or use with equipments with which the Products is not intended to be used. Flybox®, after verification of the complaint and confirmation that the defect is covered by warranty, at its sole discretion, will either replace or repair the Products at no costs for the customer. Alterations, additions, or repairs not performed by the manufacturer shall negate any warranty. This warranty doesn't cover cosmetic or incidental damages. Shipping costs, taxes, custom fee, any other duties and any costs incurred while removing, reinstalling or troubleshooting the Products, shall be at customer's charge.

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## **Out of warranty repairs**

Products that can not be repaired under warranty as out of the maximum term or that do not work for reasons that would have been covered by warranty, can be repaired at a flat rate as described on the site. For out-of-warranty eligible damages, the repair must be assessed for each individual case.

**Omnia57-80 Fuel L-P** - Installation and User Manual,  
Safety Instructions and Warning Booklet

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Date	Revision	Description
02/2019	1.0	First release
04/2021	2.0	Added Omnia80+new background+various

### **IMPORTANT**

*Do not send an instrument for repair without first filling out the support form which can be reached by clicking one of the buttons above. After filling out the form, a ticket will be opened and if we believe the instrument needs to be repaired, an RMA number will be sent to you with shipping instructions. Instruments received without an RMA code will be placed at the bottom of the repair queue.*

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