FLYBOX

INNOVATIVE AVIONICS

My-EMS

Engine Monitoring System

User Manual

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 U2024MYEMS
Revision#1.3, 10/2024
For firmware version 1.1.11

This booklet is suitable for printing in A5 format.

Symbols used in the User Manual

NOTE: Used to highlight important information.

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

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

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

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.

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.

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.

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.

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 on www.flyboxavionics.it

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.

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.

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.

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

WARNING: Installation and configuration of this instrument should only be carried out by trained and authorised professionals. See the Flyboxavionics website for a list of authorised installers.

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.

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.

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 in the "support" section.

NOTE: Check the website www.flyboxavionics.it periodically for software and manual updates.

NOTE: 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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1.1 - Primary action after installation

WARNING: Do not fly until you have performed at least the actions indicated below:

1. **Choose engine model**: the first parameter to setup is the engine selection. It can be made by entering in the *Main menu → Engine.*

2. **Tank level sensors**: (if connected). It's indispensable to perform the calibration for all the tank level sensors connected to *My-EMS*. Without performing calibration and settings no indication will be furnished. It is responsibility of the user to check during the first flights and over time the goodness of the calibration and therefore the instrument indications. The verification can be done in any moment, for example by simply checking the quantity put to fill the tank: if you know that the tank filled contain 40 liters and *My-EMS* indicate as remaining quantity 10.0 liter, you know that to fill the tank you must put approximately 30 liters. Of course keeping in mind that in ground the indications will be different that in flight because of the flight's attitude. This problem is present also in the traditional analog gauge indicators, but is more difficult to detect because of the non-numeric indication. Another verification is, in case of low remaining quantity (i.e. 4~5 liters), drain and measure it.

3. **Fuel computer**: (if installed). If it's installed the fuel flow transducer, *BEFORE* rely on informations provided by the fuel computer section you must:

- Verify that the K-factor set in *My-EMS* is pertinent to the installed fuel flow transducer.

- Execute the fuel flow transducer calibration as explained in chapter *1.3.3.12 - Fuel Computer*. Without calibration the fuel computer informations may be wrong, even if the nominal K-factor is correct for the fuel flow transducer used. After calibration, the K-factor should have been calculated automatically and at best for every single installation. You must still check for some time if the remaining quantity indicated are reliable compared to the refuelling performed. For example, if the instrument indicate a remaining quantity of 35 liters and you know that the tanks capacity is 80 liters, filling the tanks should require approximately 45 liters; in case of much difference redo the calibration. Consider also that, during use, little errors accumulate and if you never fill the tanks you never “reset” all these errors.

1.2 - Panel indicators and commands

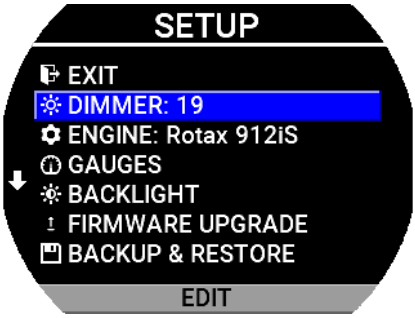
The knob is used to scroll between different screens and navigate menus. The knob button allows different actions within the menus.

1.3 - Instrument configuration

Before using *My-EMS* you need to configure it; read completely this chapter and follow step by step the sections to completely configure all the sensors, alarms and preferences available.

1.3.1 - Entering & Browsing the menus

To enter the main menu press and hold the knob button for 1 second.



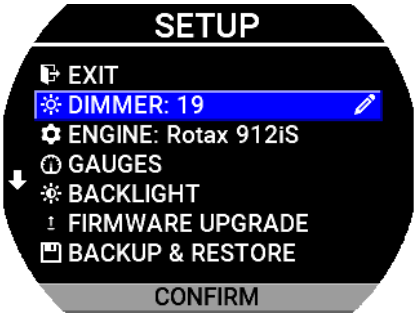
The label near the knob identifies the action that is going to be performed.

For example, to change the display brightness:

- Select *Dimmer* by pressing the knob button;a pencil icon in the right side appears and starts to blink , this means that the selected item is editable.

- Turn the knob to change the value, then push again the knob button to confirm the selected value.

- To return the value to the initial value, hold the knob button for 2 seconds.



This way of working is the same for editing all parameters inside the various menus.

NOTE: in all menus and submenus there is an *EXIT* item that allows instant return to the monitoring pages.

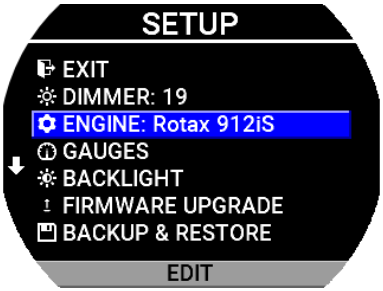
NOTE: in the submenus, the *BACK* item returns to the parent menu.

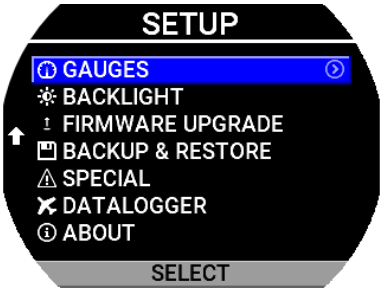
1.3.1.1 - Common items description

To avoid repetition, common menu items are described in the current section. Only functionality is described, any other options will be specifically when required.

- **Enabled:** enables or disables the visibility of the gauge on the display, can be YES or NO (*default YES*).
- **Filter:** assigns the strenght of the digital filter in a range from 1 to 10. If the measure is affected by noise, increase the value. If there is a delay between the input change and the measurement, the value should be decreased (*default 1*).
- **Unit:** assigns the measurement unit.
- **Type:** sets the probe type according to your electrical installation.
- **Upper Warning:** enable or disable the measurement check on exeeding the *High* threshold, can be YES or NO (*default YES*).
- **Lower Warning:** enable or disable the measurement check on exeeding the *Low* threshold, can be YES or NO (*default YES*).
- **Warning:** enable or disable the measurement check, can be YES or NO (*default YES*).
- **Output:** you can choose to enable or disable the alarm output on *My-EMS*, can be ON or OFF (*default OFF*).
- **Delay:** set how many second the condition must persist before trigger the alarm (*default 0.5*).

1.3.2 - Main menu





- **Dimmer:** display brightness adjustment can be a value between 1 and 19 *(default 19)*.
- **Engine:** selects the engine model, this choice will change the way some parameters are read. Available options are:

Value
Rotax 912 *(default)*
Rotax 914
Rotax 912iS
Rotax 915iS

Value (cont.)
Generic

- **Gauges:** enter the “Gauges” menu.
- **Backlight**: enter the “Backlight” menu.
- **Firmware Upgrade:** start the firmware update function from USB flash drive.
- **Backup & Restore:** starts the function of saving/ restoring parameters to/from USB flash drive.
- **Special:** enter the “Special Functions” menu.

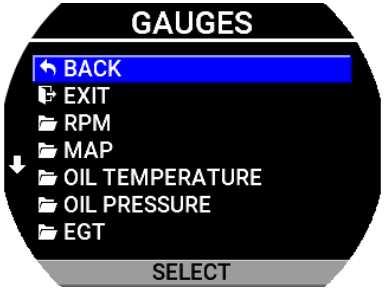
- **Datalogger:** enter into the flight log viewer. This item is available if *PRO version* has been purchased. This item is not visible while the engine is running

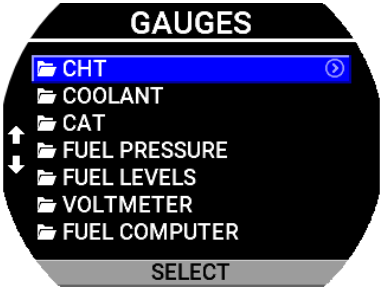
- **About:** enter the screen with device information.

NOTE: This menu will automatically close after 5 seconds of inactivity.

1.3.3 - Gauges menu

In this menu is possible to set parameters for all available measurement listed below.



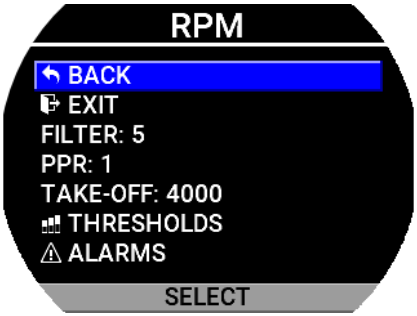


- RPM
- MAP
- OIL TEMPERATURE
- OIL PRESSURE
- EGT
- CHT
- COOLANT
- CAT
- FUEL PRESSURE
- FUEL LEVELS
- VOLTMETER
- FUEL COMPUTER
- GPS

- **Output mode:** changes the behavior of the alarm output. It can be set as *SWITCH* (default) or as *TONE* generator.

NOTE: To connect the output in *TONE* mode to an audio input, *Audio Tone adapter cod.105899* is required.

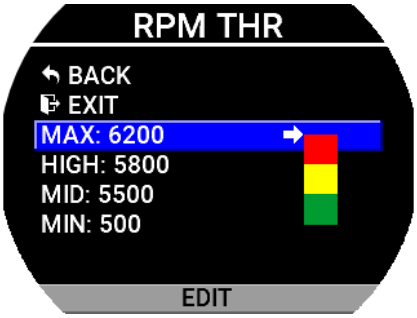
1.3.3.1 - RPM



- **Filter:** as in chapter *1.3.1.1 - Common items description.*
- **PPR (pulse per revolutions)**: this is the number of pulses the sensor counts for each revolution of the engine. This value doesn't affect the RPM calculation if the data is read from an ECU. It has a range from 1 to 200 (*default 1*).
- **Takeoff:** set the RPM required to start the flight timer (the flight timer start automatically when the engine's RPM meets or exceeds this parameter for 30 seconds). It has a range from 1000 - 6000 (*default 4000*).

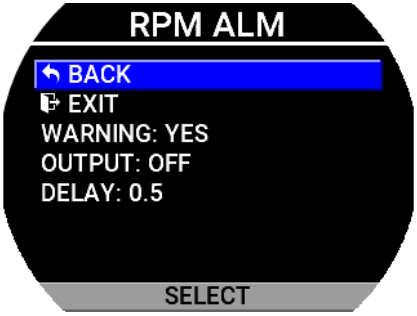
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg. yellow range, red range).



Alarms

Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold.

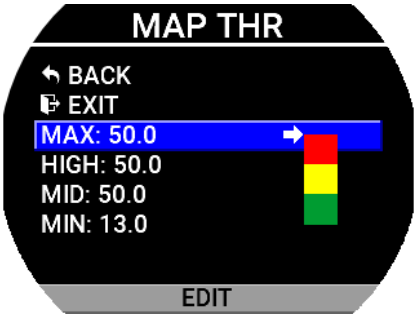


- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*
- **Delay:** as in chapter *1.3.1.1 - Common items description*

1.3.3.2 - MAP

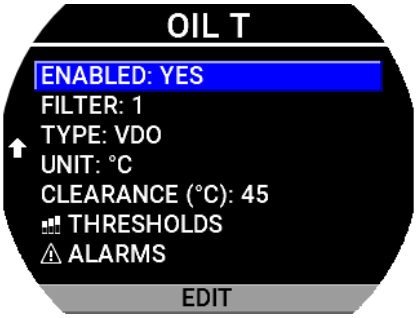
- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description.*

Thresholds



Assigns the outer limits of the indicator and the ranges of the various thresholds (eg. yellow range, red range).

1.3.3.3 - Oil temperature



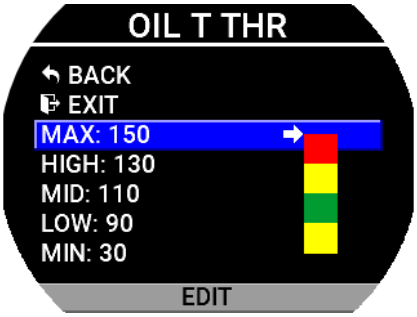
- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Unit:** as in chapter *1.3.1.1 - Common items description*. Option available are *°C* or *°F* (default °C)
- **Type:** as in chapter *1.3.1.1 - Common items.* Options available are:

Menu Label	*Description*
VDO (default)	Rotax VDO 323-057 150°C
P1K	PT1000 thermistor
399S7B	Westach 399S7B

- **Clearance:** assigns the temperature above which the ready motor condition can be triggered. (defaut 50°C - 122°F)

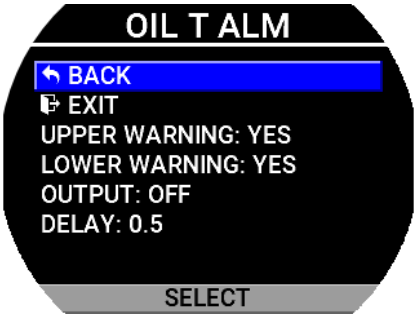
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg. yellow range, red range).



Alarms

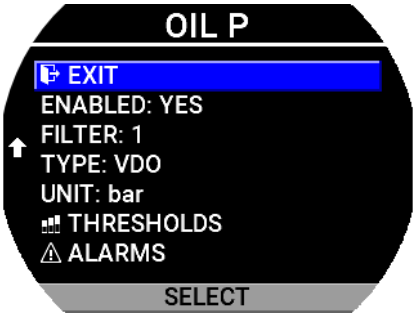
Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold.



- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*

- **Delay:** as in chapter *1.3.1.1 - Common items description*

1.3.3.4 - Oil pressure

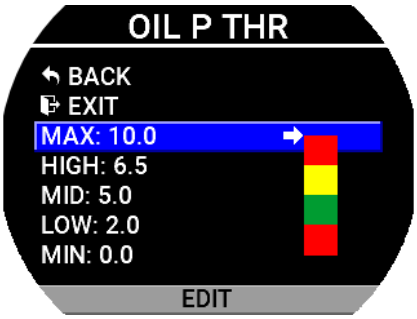


- **Enable:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Unit:** as in chapter *1.3.1.1 - Common items description*.
  Option available are *bar* or *psi* (default bar)
- **Type:** as in chapter *1.3.1.1 - Common items description*. Options available are:

Menu Label	*Description*
VDO *(default)*	Resistive sensor usually installed on Rotax 10bar fullscale
4-20	Sensor with 4-20mA current loop

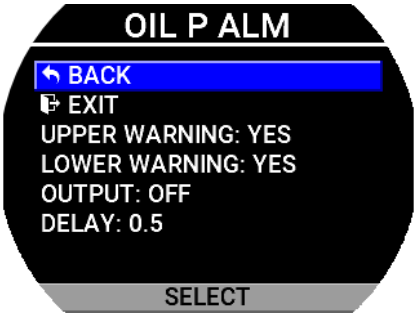
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg. yellow range, red range).



Alarms

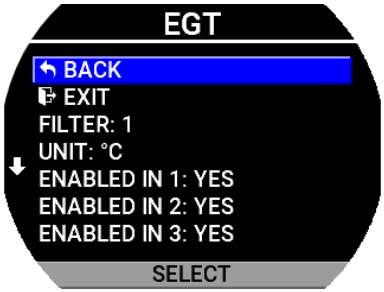
Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold or drop below the *Low* threshold.

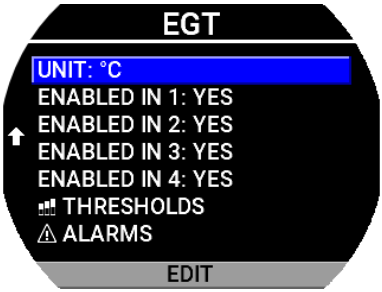


- **Upper Warning:** as in chapter *1.3.1.1 - Common items description*.

- **Lower Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Output:** as in chapter *1.3.1.1 - Common items description*.
- **Delay:** as in chapter *1.3.1.1 - Common items description*.

1.3.3.5 - EGT



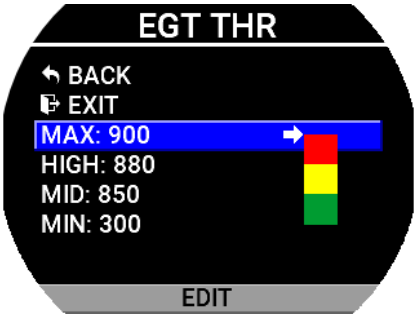


- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Unit:** as in chapter *1.3.1.1 - Common items description*. Option available are *°C* or *°F* (default °C)
- **Enabled input 1-4:** enable or disable the reading of the signale from a specific input.

NOTE: Input number are directly associated to the cilynder number. Refer to the engine manufacturer manuals for cylinder numbering.

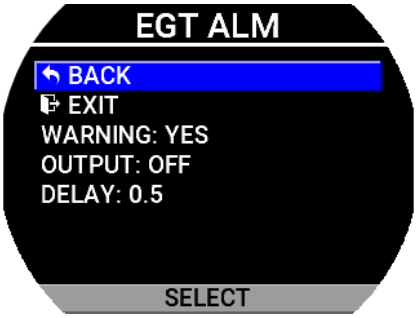
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg. yellow range, red range).



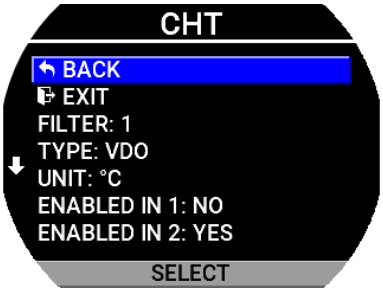
Alarms

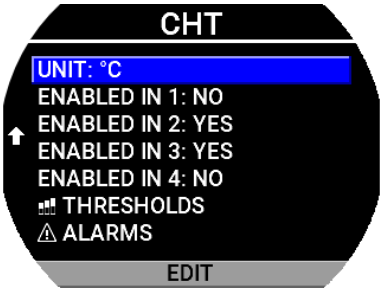
Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold.



- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*
- **Delay:** as in chapter *1.3.1.1 - Common items description*

1.3.3.6 - CHT





- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Type:** as in chapter *1.3.1.1 - Common items.* Options

Menu Label	*Description*
VDO *(default)*	Rotax VDO 323-057 150°C
TCJ	Thermocouple type J

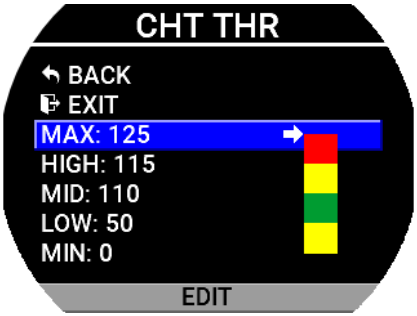
available are:

- **Unit:** as in chapter *1.3.1.1 - Common items description*. Option available are *°C* or *°F* (*default °C*)
- **Enabled input 1-4:** enable or disable the reading of the signale from a specific input.

NOTE: Input number are directly associated to the cilynder number. Refer to the engine manufacturer manuals for cylinder numbering.

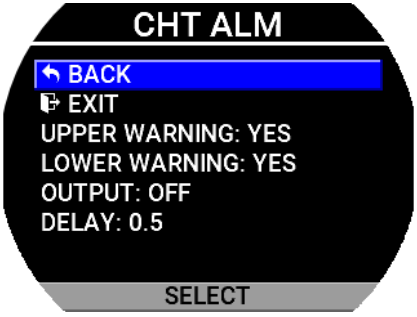
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg yellow range, red range).



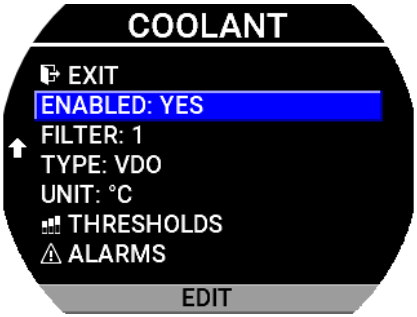
Alarms

Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold or drop below the *Low* threshold.



- **Upper Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Lower Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Output:** as in chapter *1.3.1.1 - Common items description*.
- **Delay:** as in chapter *1.3.1.1 - Common items description*.

1.3.3.7 - Coolant



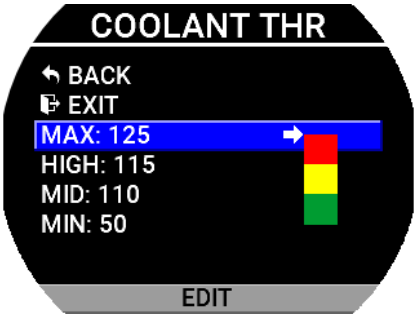
- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Type:** as in chapter *1.3.1.1 - Common items.* Options available are:

Menu Label	*Description*
VDO *(default)*	Rotax VDO 323-057 150°C
TCJ	Thermocouple type J

- **Unit:** as in chapter *1.3.1.1 - Common items description*. Option available are *°C* or *°F* (*default °C*)

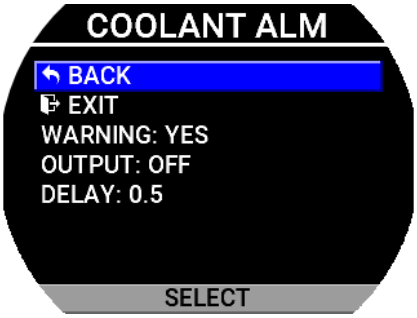
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg yellow range, red range).



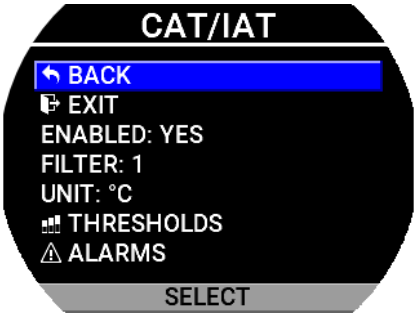
Alarms

Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold.



- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*
- **Delay:** as in chapter *1.3.1.1 - Common items description*

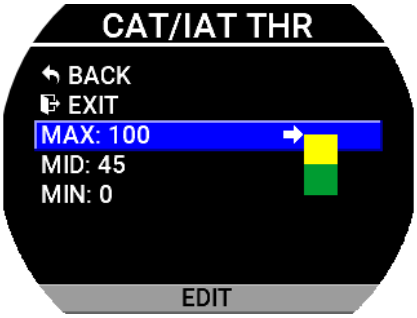
1.3.3.8 - CAT/IAT



- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Unit:** as in chapter *1.3.1.1 - Common items description*. Option available are *°C* or *°F* (*default °C*).

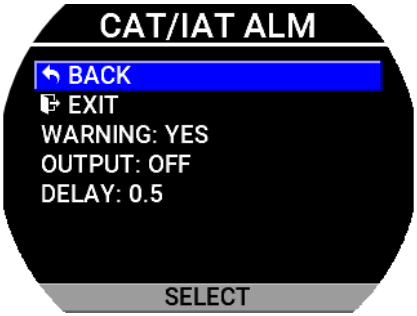
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg yellow range, red range).



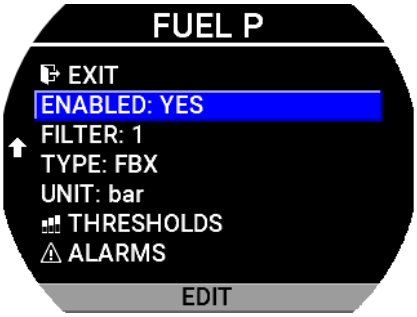
Alarms

Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold.



- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*
- **Delay:** as in chapter *1.3.1.1 - Common items description*

1.3.3.9 - Fuel pressure



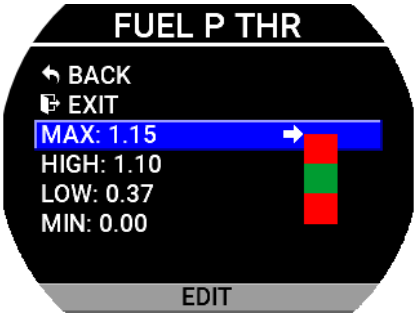
- **Enable:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Type:** as in chapter *1.3.1.1 - Common items.* Options available are:

Menu Label	*Description*
FBX *(default)*	Flybox Cod. 601041
KAV150	Kavlico v2, 1/8-27. NPT, 150 PSI
UMA70D	UMA N1EU70D (0.2 - 4.7Vout)

- **Unit:** as in chapter *1.3.1.1 - Common items description*.
  Option available are *bar* or *psi (default bar).*

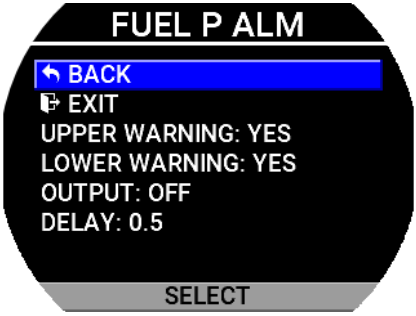
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg yellow range, red range).



Alarms

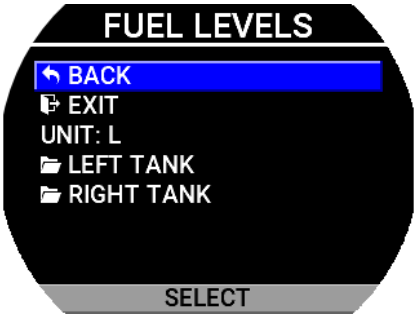
Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold or drop below the *Low* threshold.



- **Upper Warning:** as in chapter *1.3.1.1 - Common items description*.

- **Lower Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Output:** as in chapter *1.3.1.1 - Common items description*.
- **Delay:** as in chapter *1.3.1.1 - Common items description*.

1.3.3.10 - Fuel levels



- **Unit:** as in chapter *1.3.1.1 - Common items description*.
  Option available are L, usg or imp *(default L).*

Tanks submenu

Selecting the *Left tank*, *Right tank* menu items takes you to the individual tank settings submenus. The menu items are the same for all tanks, so to avoid repetition only one of the three will be explained.

- **Enabled:** as in chapter *1.3.1.1 - Common items description*.

- **Sender**: selects the type of level sensor. Option available are:

Menu Label	*Description*
Resisitve+ *(default)*	Resistive fuel sensors that increase resistance as you add fuel.
Resisitve-	Resistive fuel sensors that decrease resistance as you add fuel.
Cap	Capacitive with output between 0 and 5 volts.

- **Filter:** as in chapter *1.3.1.1 - Common items description*.

- **Calibration step:** with this parameter it's possible to choose the fuel quantity to add at each calibration step. Choose a proper value considering the tanks capacity and how many calibration steps you want to execute. For example with a 40 liters tank and “Calibration fuel

step"set to 2 it's required 40 / 2 = 20 calibration steps. Consider also that the maximum number of calibration steps that is possible to store in memory for every tank is 50. The "Cal. steps" parameter is used for all the tanks calibrations, don't modify it once you have choosed a value. It has a range from 1 to 5L (default 3L).

- **Min. Incr (mV):** minimum thresold to detect fuel sensor movements *(default 20, it is preferable to leave this value unchanged)*.

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.

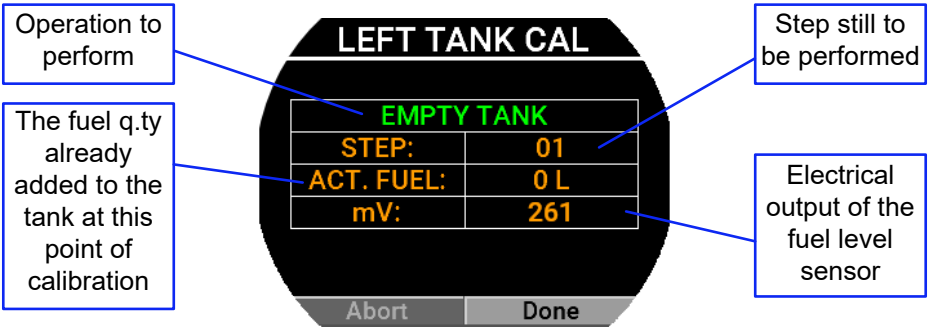
A good practice to make the float stabilize on the fuel is to give a shake to the plane. This can sometimes overcome the friction of some floats that tend to be sticky.

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

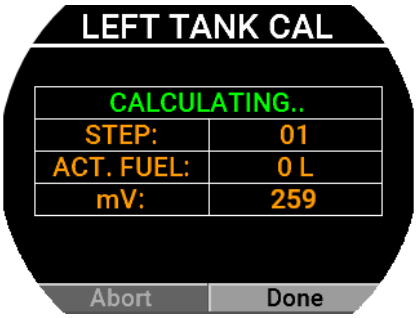
After confirming the calibration function, the screen above will appears.

Select *Exit* to quit the calibration procedure.

Select *Start* to begin a new calibration, this screen will appear.

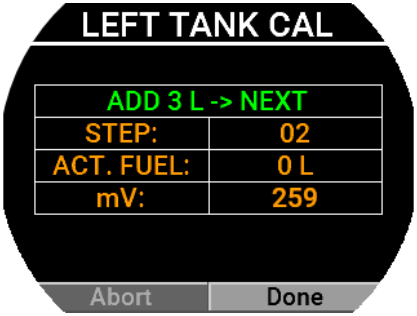


Step 1: Check that the tank is empty, wait for the mV indication to be stable and selct *Done* to proceed to the next step.



At this step the actual fuel is 0 L.

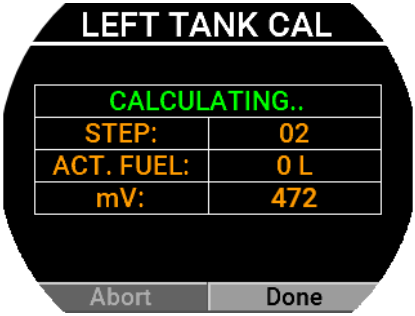
After *Done* has been selected, the microcontroller will calculate the mV average value for few seconds, then the screen below will appear. Now you are ready for the next step.



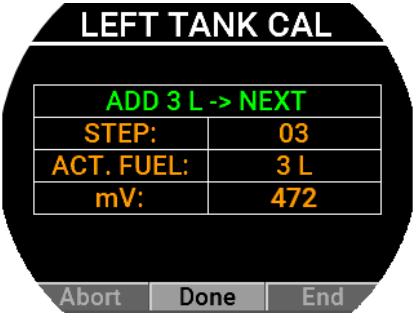
In the example, the *Calibration step* value is set to 3 liters

Step 2: Now add the fuel indicated in the green field (it's the same quantity choosen in the *Calibration step* parameter).

Step 3: Wait for the new mV indication to be stable and proceed to the next step by pressing *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 screen as above, before moving on to this screen.

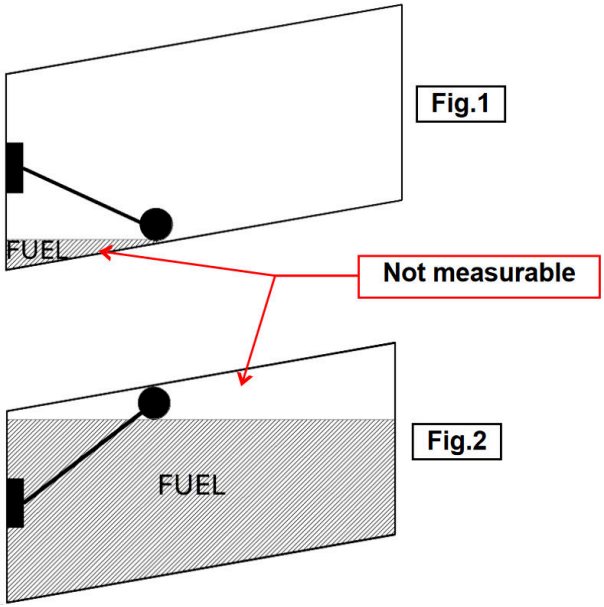


Next steps: repeat step #2 and step #3 until tank is completely filled. When the tank is filled: press *Done* to confirm the last calibration step and then select *End* to end the calibration. You will be asked for a confirmation.

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:

- 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, *My-EMS* notices that the fuel sensor doesn't produce an electrical change and asks the user if fuel is already added

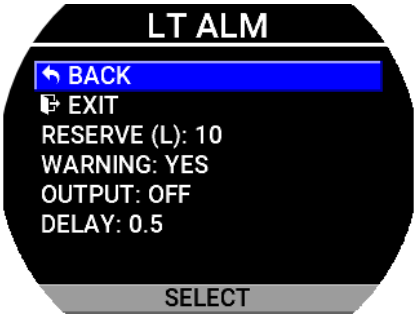
for that calibration step:

If you are sure to have already added the fuel, confirm on *YES* otherwise press *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.

This calibration procedure is also identical for the *Right Tank.*

Alarms



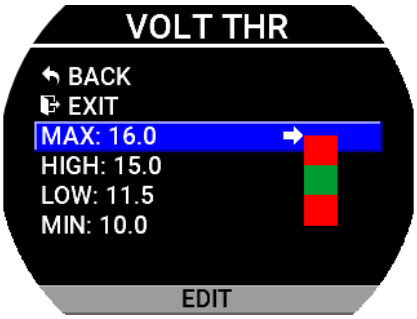
- **Reserve:** set the amount of fuel below which is activated the alarm of low fuel level for the selected tank. Range from 0 to 20L *(default 10).*
- **Warning:** as in chapter *1.3.1.1 - Common items description*
- **Output:** as in chapter *1.3.1.1 - Common items description*
- **Delay:** as in chapter *1.3.1.1 - Common items description*

1.3.3.11 - Voltmeter

- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.

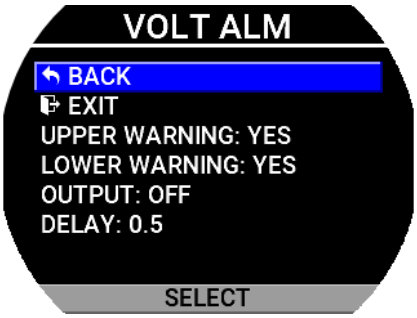
Thresholds

Assigns the outer limits of the indicator and the ranges of the various thresholds (eg yellow range, red range).



Alarms

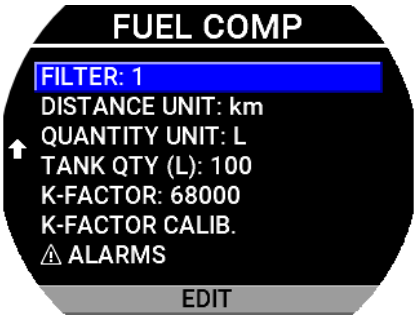
Configure the measurement checking system to trigger an alarms if the measure exceed the *High* threshold or drop below the *Low* threshold.



- **Upper Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Lower Warning:** as in chapter *1.3.1.1 - Common items description*.
- **Output:** as in chapter *1.3.1.1 - Common items description*.
- **Delay:** as in chapter *1.3.1.1 - Common items description*.

1.3.3.12 - Fuel computer

NOTE: This item is available only if the *PLUS or PRO version* has been purchased.



- **Enabled:** enables or disables the fuel computer function. If disabled the fuel management page, the fuel computer screen and fuel flow indication will not be visible.
- **Filter:** as in chapter *1.3.1.1 - Common items description*.
- **Distance unit:** assing the measurement unit for distance (used for *Range* indication). Option available are *km* or *NM (default km)*.
- **Quantity unit:** assing the measurement unit for the quantity indications. Option available are *L, usg or imp (default L)*.
- **Tanks cap:** set the total capacity on-board as the sum of all the usable fuel in all tanks. *(range 0-150lt, 0-40 gal, 0-33 imp)*.
- **Adjust:** multiplication factor for the fuel flow value

sent by the ECU. Use it if the value received turns out to be very different from reality. (*range 0.01-2.00*)

- **K-Factor:** the K-factor of a fuel flow transducer is the number of electric pulses for 1 gallon of fuel flown (if you have the K-factor in liters you must multiply this value by 3.78 before set *K-Factor* parameter in the instrument). Make sure about fuel flow transducer compatibility of the electrical signals of amplitude and frequency and follows the manufacturer instructions to set the right *K-Factor* value. The K-Factor can be manually modified or automatically calculated with the *K-Factor calibration* function. It's recommended also to execute the K-factor calibration as soon as possible to have the maximum accuracy.

K-Factor calibration

NOTE: it's recommended to perform the calibration right after installing the instrument. Not necessary if data is provided by the ECU.

1. With the aircraft in level attitude, fill the tank/s of fuel; note that in the step #4 it's required to refill the tank/s at the exact level reached here.

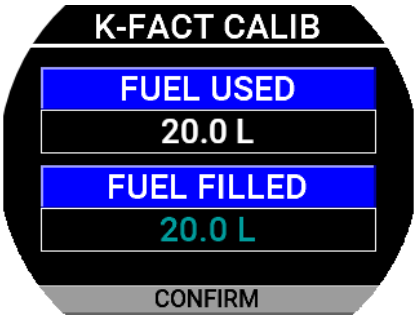
2. Turn-on the instrument and select ***FILLED*** when asked for the fuel quantity.

3. Burn at least 1/2 of fuel in the tank/s: a greater amount of burned fuel will increase the accuracy, and you can do this step in more flights: at the beginning of each flight you must not add fuel in the tank/s and you must select ***NO REFUEL*** when asked after turning on the instrument.

4. Fill the tank/s with the exact same level reached in the step#1, accurately measuring the quantity of fuel added in the tank/s.

5. Turn on *My-EMS* and select ***NO REFUEL*** (even though you have refilled it's required to select ***NO REFUEL***).

6. Enter menu→Gauges→Fuel Computer→K-Factor Calib, the following screen will appear:



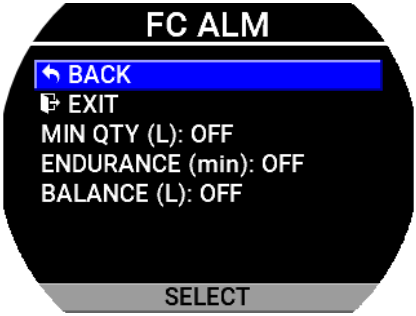
7. In the FUEL FILLED field, now insert the exact quantity of fuel you have added and measured in step #4; probably it doesn't correspond exactly to the FUEL USED because this is the measurement from the transducer not yet calibrated and it's showed for reference only. To insert the value rotate the knob then press on CONFIRM to calculate the new value.

8. As soon as confirmed, the display will briefly show the newly calculated K-factor and return to the Fuel Computer menu. The transducer is now calibrated and the K-factor is automatically stored in memory.

During later refuelling, it will be important to check that the fuel computer indication is correct. If the indication is very

far from reality you can re-calibrate or manually change the *K-Factor.*

Alarms

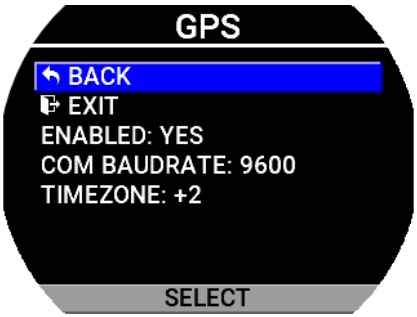


- **Min Qty:** set the fuel quantity for the *Reserve Alarm*. When the remaining quantity (*REMAIN*) is below this setpoint, the alarm is activated *(range: 1 to max of Tank capacity, default OFF).*

- **Endurance:** set the minimum time, in minutes, for the *Endurance Alarm*. When the endurance time (END.) is below this setpoint the alarm is activated *(range: 0~1000min, default OFF).*

- **Balance:** set the fuel quantity for the Balance Alarm. Every time the quantity of fuel used equals this value, *My-EMS* will activate an alarm showing *TANK SWITCH* on the display. This function is useful to keep balanced two wing tanks, switching from one to the other after using a certain quantity of fuel *(range: 1 to max of Tank capacity, default OFF).*

1.3.3.13 - GPS



- **Enabled:** as in chapter *1.3.1.1 - Common items description*.
- **COM Baudrate:** assing the baudrate at the COM1 serial port. Options availables are:

Baudrate
4800
9600 (default)
19200
38400
57600
115200

- **Time zone:** change the time zone value from -12 to +13.

1.3.4 - Backlight

- **Mode:** select the way to change display backlight. Options are *Auto* or *Manual (default)*. *Manual* mode allow to vary the light intensity by changing the *Dimmer* paramater.

- **Smoothness:** choose how fast the backlight changes when there is a variation of light on the sensor. It has a range from 1 to 3 *(default 1).*

- **Min light(%)**: choose minimal backlighting when the environment is dark. It has a range from 1 to 20 *(default 1).*

NOTE: *Auto Mode* requires installation of the *Wired Ambient Light Sensor cod. 105800.*

1.3.5 - Firmware upgrade

This menu is used for upgrading the firmware versions of *My-EMS* using a USB 2.0 flash drive.

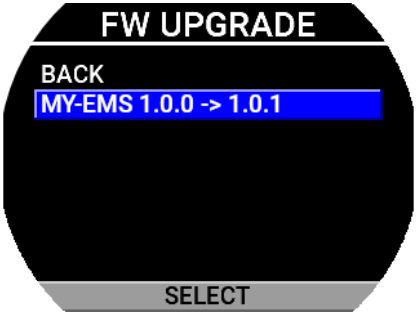
If you have received the upgrade files for *My-EMS,* copy it in the root folder of a USB 2.0 flash drive.

NOTE: If you received the file in zip format, unzip the content (without folder creation) in the root folder.

CAUTION: DON'T RENAME THE FILE OR CHANGE EXTENSION, otherwise the system won't be able to recognize it.

You can then check or upgrade by following this procedure:

1. From the main menu, select *Firmware Upgrade*.
2. Insert the USB 2.0 flash drive with the upgrade files to the rear connector.
3. If file is correctly recognized the upgrade list will populate as in the next image.



4. Select the update then press *SELECT*.

5. Wait until the firmware upgrade is completed then turn off the power and remove the flash drive.

NOTE: Before the firmware upgrade *My-EMS* automatically perform a backup of the settings on the USB flash drive. If there is already a backup file on the USB flash drive, it will be overwritten so before upgrading the firmware move it in another location if you want to keep it.

1.3.6 - Backup & Restore

This menu is used to save or restore all the settings and calibrations of your *My-EMS*.

Backup: Insert a USB flash drive in the USB rear connector on *My-EMS* and then push *ENTER* with this item selected to save all the settings on the USB 2.0 flash drive.

The filename of the backup is ***MY_EMS_xxxxxxxx.par***. where *xxxxxxxx* is the ID number of the device (eg. MY_EMS_123456AB.par)

NOTE: It's recommended to perform the backup right after finishing to set the instrument and copy the *MY_EMS_xxxxxxxx.par* file in a safe place to have the opportunity to recall the settings if needed.

Restore: Insert the USB flash drive where you have previously performed the backup (or manually copy the backup file *MY_EMS_xxxxxxxx.par* in a USB 2.0 flash drive) and then push *ENTER* with this item selected to restore all the settings on *My-EMS*.

NOTE: all current parameters will be overwritten after the restore.

1.3.7 - Special

This menu allows the user to change parameters that are considered sensitive. Therefore, acceptance to access in this menu implies taking responsibility on the part of the user.

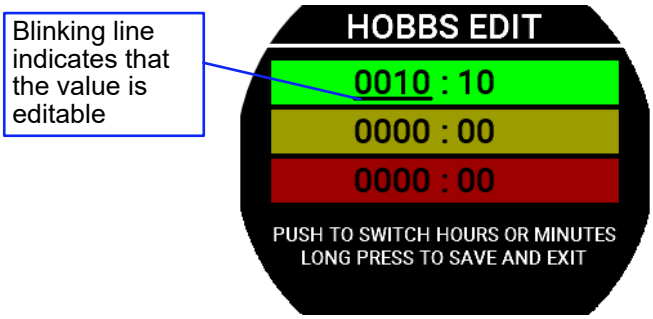
- **Restore Defaults**: returns all settings to their default state
- **Erase Fuel Level Calib**: clears tank calibrations.

- **Erase Fuel Comp. Data**: erases the calculated data from the fuel computer, returning it to its initial state.
- **Reset Engine Peaks**: cancels the engine's peak rpm.
- **Edit Hobbs Meters:** opens the engine hours edit screen (*chapter 1.3.7.1 - Hobbs meters editor*).

1.3.7.1 - Hobbs meters editor

This feature allows the modification of engine hours.

1. Enter the *menu→Special→Edit Hobbs Meters*. The following screen will appear.



2. Scroll to choose the range you want to edit than push the knob button.

3. The hours become underlined (with the line blinking). Change the value by turning the knob and press the button to confirm.

4. Now minute become underlined (with the line blinking). Change the value by turning the knob and press the button to confirm.

5. Repeat from step #2 if you want to edit other ranges.

6. Hold the button for 3s to close the page and save the new values.

Page intentionally empty

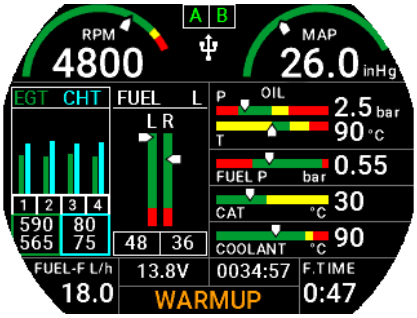
2.0 - Using My-EMS

My-EMS is organized into 3 monitoring screens. After power-on it will show the main engine data page. To switch between the four pages turn the knob.

NOTE: in this manual is presented the full version of the pages but your *My-EMS* may differ depending on the optionals and sensors installed in your aircraft.

NOTE: The fuel monitoring page depends on fuel computer so it must be purchased and activated, as explained in chapter *1.3.7.1 - Fuel computer activation.*

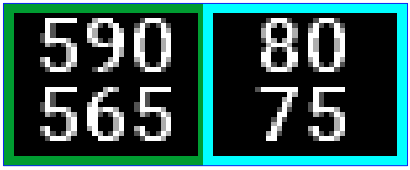
2.1 - Page 1: Engine main data



On this page all the important engine data are clearly displayed in both graphical and numerical indications. The green, yellow and red zones of the various gauges is completely customizable as explained in *chapter 1.3 - Instruments configuration*; when a measurement is on a yellow or red zone the corresponding numerical indication change it's color to yellow or red.

Available parameters are:

- **Engine rpm:** graphical and numerical indication.
- **MAP:** graphical and numerical indication, expressed in *inches of mercury*.
- **Oil pressure:** graphical and numerical indication, expressed in *bar* or *psi* depending on user settings.
- **Oil temperature:** graphical and numerical indication, expressed in *°C* or *°F* depending on user settings.
- **Coolant temperature:** numerical indication, expressed in *°C* or *°F* depending on user settings.
- **CAT:** numerical indication, expressed in *°C* or *°F* depending on user settings.
- **Fuel pressure:** graphical and numerical indication, expressed in *bar* or *psi* depending on user settings.
- **EGT and CHT**: graphical and numerical indication, expressed in *°C* or *°F* depending on user settings. An indication of the hottest (top value) and coldest (bottom value) is provided within the gauge.



- **Lane status:** indicates if the ECU lane are working properly (A or B in green). If one is missing the relative ID became red. This gauge is visible only for electronic injected engine.

- **Engine status indicator and annunciator panel:** this is a useful indicator that should be checked before takeoff. When the essential measurements are not in a safe area the indicator shows *WARMUP* in orange; When all the measures becomes in its safe zone the indicator change state to *READY* in green, that automatically disappear 30 seconds after take-off. Alarms related to the parameters are also displayed. These are displayed with yellow text for CAUTION type and with red text for WARNING type alarms.

- **Fuel levels:** graphical and numerical indication, expressed in *L, usg or imp* depending on user settings. The fuel level indications here are obtained by reading the fuel level sensors installed in your aircraft and connected to *My-EMS*. The indications are approximated, do not solely rely on *My-EMS* to determine the fuel available in the tanks but always refer to primary instrument installed in your aircraft.

- **Voltage:** numerical indication.

- **Fuel flow:** according to the selected unit of measure the flow is indicated in liters per hour (L/h), gallons per hour (gph) or imperial gallons per hour (igph).

- **Flight time:** duration of the last flight.

- **Hobbs:** total time accumulated by the engine.

2.2 - Page 2: Timers

Available parameters are:

- **Engine rpm:** as in page 1.
- **MAP:** as in page 1.
- **Lane status:** as in page 1.
- **Engine time:** total time accumulated by the engine.This time is further divided in total time accumulated in green, yellow and red zones.
- **Last flight time:** duration of the last flight.
- **Last flight rpm peak:** the maximum rpm value reached in the last flight.
- **Max rpm peak:** the maximum rpm value reached during the entire life of the engine.
- **UTC:** time from GPS (if available and connected).
- **LOC:** time from GPS corrected with time zone.

2.3 - Page 3: Fuel computer

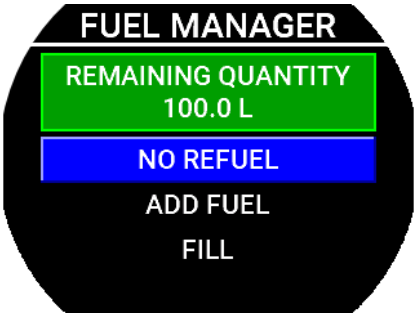
NOTE: this page is available only if *PLUS or PRO* version has been purchased.

Before using the fuel computer section you must be sure to have already set the following parameters:

1. Set the measurement unit for ***Quantity*** and ***Distance***.
2. Set the ***Tanks cap.***
3. Set the ***K-Factor*** of your sender. (Not necessary for fuel injected engine).

As explained in chapter *1.3.2.12 - Fuel computer*.

At every startup of the instrument you will be asked if refueling has been done, one the following options must be selected:

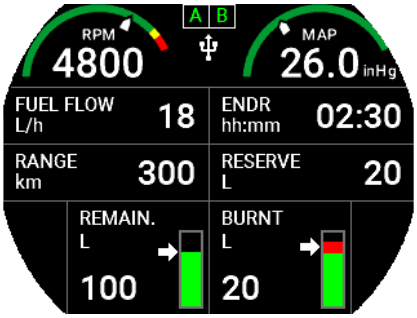


- **NO REFUEL:** Select this option if you have not refuelled the tank.
- **ADD FUEL:** Select this option if you have added fuel to the tank(on the next screen that appears you can insert

the exact amount of fuel added).

- **FILLED:** Select this option if you have filled the tank; the display will show the quantity that has been added to reach the full level. Before using this option you must have already set the tank/s capacity in the fuel computer setup.

NOTE: If you need to correct a wrong fuel quantity add, select *ADD FUEL* and insert a negative value.



Now the fuel computer is ready to operate, the available indications are:

- **Engine rpm:** as in page 1.
- **MAP:** as in page 1.
- **Lane status:** as in page 1.
- **Fuel flow:** according to the selected unit of measure the flow is indicated in liters per hour (L/h), gallons per hour (gph) or imperial gallons per hour (igph).

- **Endurance (ENDR):** display the time to empty, calculated considering the fuel remaining and the actual fuel flow. If it is not possible to calculate the time to empty (for example when the engine is not running) the display shows “--:--”.

- **Remaining fuel (RMNG):** display the fuel remaining in the tank/s. According to the selected unit of measure the quantity is indicated in liters (L), gallons (gal) or imperial gallons (imp).

WARNING: the remaining fuel displayed here is not a measurement of the fuel in the tank, but it is calculated from the initial quantity entered by the user and the burned quantity measured by the fuel flow transducer (or measured by the ECU for fuel injected engines).

- **Burned fuel:** display the fuel burned from the starting. According to the selected unit of measure the flow is indicated in liters (L), gallons (gal) or imperial gallons (imp).

- **Range:** display the range calculated considering the fuelremaining, the actual fuel flow and the ground speed from GPS. If the display shows *NO RMC DATA* it means that the GPS is not connected, turned off or it don't have the fix. If it is not possible to calculate the range (for example when the engine is not running) the display shows “- - - -”.

- **Reserve:** display the fuel remaining at destination; the destination is intended as the approaching GPS waypoint. If the number is negative it means that there is not enough fuel to reach the destination. To enable this indication you must connect an external GPS and enable the “RMB” sentence on it. If the display shows NO RMB DATA it means that the GPS is not connected,

turned off or it don't have the fix. If it is not possible to calculate the reserve (for example when the engine is not running) the display shows “--.--”.

3.0 - Alarms

My-EMS continuously monitor all the sensors and when a measurement exceed its setpoint, either the probe/sensor making the measurement disconnects, the corresponding alarm is activated (if enabled by the user).

An alarm condition is indicated in this ways:

- The gauge value will change color to red.

- In the annunciator panel a description of the alarm is displayed.

- If the output has been enabled it will be turned on.

Giving acknowledge by pressing the knob button will make the message disappear in the annunciator panel. In case of multiple alarms these will be displayed within the annunciator panel sequentially.

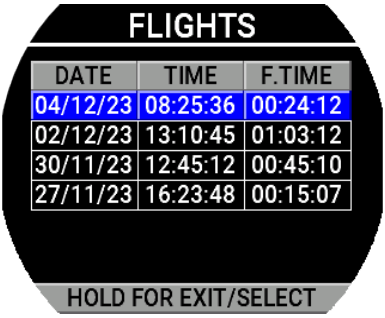
If "XXX" is indicated next to the gauge, it means the sensor/probe is disconnected, while "---" indicates that the data from an ECU was not received.

4.0 - Datalogger

NOTE: available only if the *PRO version* has been purchased.

NOTE: this screen is not accessible while the engine is running.

The datalogger is a useful data recording tool that permits later viewing in both graphical or numerical representation. It also allow the download of the data in a USB flash drive.



Data are organized in separate recording sessions, each time the engine is started a new recording session will be initiated.

The memory can store 100 hours of data, with a sample rate of 1 second. Older data are automatically erased to make room for the new ones. Datalogger menu is the list of all recorded flight sorted by date (recent flights are at the top of the list). The date, UTC, and duration (flight time) are visible for each flight.

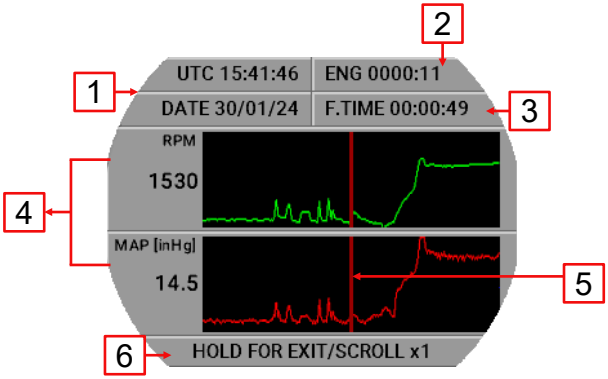
NOTE: date and utc are only available if a GPS has been

connected and a fix has been made. If this information is not available instead of utc time the engine hours will be displayed.

Turn the knob to select the desired flight in the list. The push the button to choose it (holding the button for 3 seconds will close the current screen and return to the menu). The following popup menu will appear at bottom of the display:

- **Back:** close the popup and return to the flight selection.
- **Save:** begin the log export process on the USB flash drive. Saved files are in CSV (comma-separated values) format.
- **View:** open the flight in view mode.

View mode allows you to view charts of the data recorded in the selected flight. The interface will look like the image below:



1. **Date and time:** date and time referred to the cursor position (5).

NOTE: the date and time indications is read from an external GPS, if connected; if no GPS is connected to *My-EMS*, these indications will not be available.

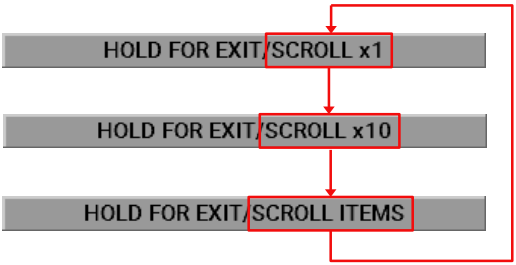
2. **Engine hours:** total accumulated engine hourmeter referred to the cursor position (5).

3. **Flight time**: displays the elapsed time since the start of the flight referred to the cursor (5).

4. **Graphics and numerics data:** 2 charts per page.

5. **Cursor:** the cursor permits to analyze the flight throughout its duration. All numerical values are relative to the actual position of the cursor.

6. **Actual knob function:** hold the knob button for 3 seconds to return at the flight list selection. Pushing it will change between scrolling the values (x1 or x10) or scrolling through the items.



The datalogger records all measurements displayed on *My-EMS* screens. The charts displayed therefore depend on what measurements the user has set in the instruments settings.

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5.0 - Technical specifications

- Graphic TFT LCD with backlight and coated glass, 3.5”.
- Powder painted aluminium case.
- Dimensions: 85 x 85 x 40 mm. (body)
- Weight: 230 g.
- Supply voltage: 10 ~ 30 V=.
- Power supply: ~2 W
- Operating temperature range: -20 ~ +70°C.
- Storage temperature range: -30 ~ +80°C.
- Humidity: 90% max (without condensation).
- Communication through 2 CAN bus and 1 RS232
- USB port: for USB 2.0

Display cleaning

To clean the display use the supplied smooth cloth, slightly moistened with cleaner. Use a cleaner that is specified as safe for anti-glare coatings.

CAUTION: Avoid any chemical cleaners or solvents that can damage the display anti-glare coating or plastic components. Do not use cleaners containing ammonia. Do not spray water or cleaner directly onto the display.

One Year Warranty:

Product support and warranty information can be found at 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 maintenence, 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 manufactuter 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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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.

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Date	Revision	Description
February 2024	1.0	First release
May 2024	1.1	Added *Enable* in fuel computer menu
May 2024	1.2	Improved explanation for *Datalogger* menu item
October	1.3	Added *Westach* sender for Oil Temperature. Added *Enable* for MAP. Added *Generic* engine model

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Important

Do not send your instrument for repair until you have filled out the request form on the support page at www.flyboxavionics.it. After filling out the form you will receive an authorization email with the RMA number.

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