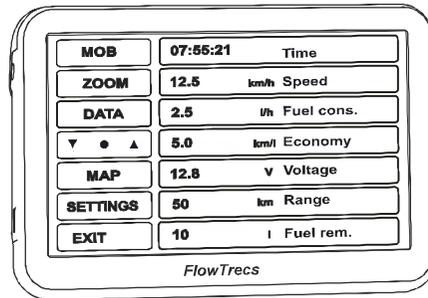


Electronic fuel consumption measurement system

FlowTrecs BT



**For engines with a power
from 20-500HP**



Device description

The Flowtrecs system is designed to display fuel consumption data such as momentary consumption, i.e. the number of fuel per hour, the number of kilometers per amount of fuel, i.e. the efficiency indicator of consumption and the number of fuel remaining in the tank. The device has 6 measuring inputs, 4 of which can handle flow sensors and 2 for measuring the rotation speed or temperature (option).. This allows it to be used for simultaneous fuel consumption measurement for 2 diesel engines with fuel return or 2 or 4 gasoline engines. In addition, several other parameters are displayed: working hours, distance, speed, voltage in the 12V installation, range. Speed measurement and navigation data are computed from Global Positioning System satellite data, while fuel consumption is measured by a turbine flow sensor. The data transmission from sensors to the screen takes place via a wireless converter module working on Bluetooth technology. This eliminates the need to route sensor cables between the motor and the screen, and it is only necessary to connect the RPM measurement to an existing tachometer.

The system consists of 3 essential elements:

1. Fuel flow sensor
2. Bluetooth converter
3. TFT panel - 5 "TFT color touch screen with Android 4.4 and mounting accessories

Features available:

1. Fuel consumption
2. Total fuel consumption
3. Fuel economy indicator (number of km per 1 liter of fuel)
4. Fuel quantity, l, gal (remaining in the tank)
5. Range km, Nm
6. Speed Km / h, knots
7. Voltage V
8. Time
9. Distance
10. Open CPN marine navigation
11. Language selection (DE, ENG, PL)

Device operation

To start the system, connect the 12VDC to the power supply module and switch on the LCD panel using the switch on the housing (hold the main switch at the top left for a moment). A welcome screen will appear on the LCD display, which will switch to the application screen after several seconds.



Main screen view

It shows all the measured parameters at the same time, which makes it possible to observe all data at the same time. These are:

1. Time
2. Speed
3. Fuel consumption
4. Economy (Number of kilometers per 1 liter)
5. Tension
6. Range
7. The amount of fuel

Additionally, the following buttons are visible on the left:

1. MOB - saving the current position (Men Over Board)
2. ZOOM - switch to the combi screen
3. DATA - switch to displaying other parameters
4. ▽ ✱ △ - screen brightness adjustment
5. MAP - switching to the navigation program
6. SETTINGS - system configuration
7. EXIT - closing the application

Main screen buttons description

1. MOB - saving the current position (Men Over Board)



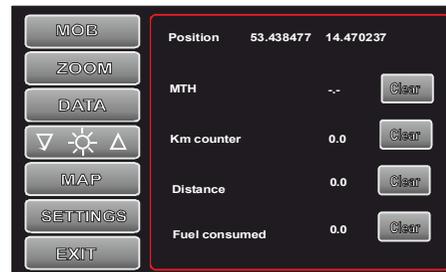
The screen above appears when MOB button is pressed. The position at the moment of pressing the button is saved and displayed at the top of the screen and can be saved in one of the 5 visible fields by holding this field for a few seconds. After saving, you can give it any name. If the name field is held down for a few seconds. Then a keyboard is displayed that allows you to enter any name of the item.

2. ZOOM - switch to the combi screen



In the combi screen, parameters can be displayed using the increased character size for better readability. The parameters to be displayed are selected using the Settings button in the ZOOM Settings item.

3. DATA - displaying engine hours and counters



After pressing this button, a screen appears with the current position, number of engine hours, total distance traveled, current distance traveled and the total amount of fuel consumed since the counter was reset. These parameters can be reset by using the Clear button.

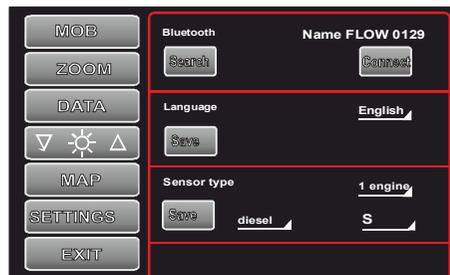
Attention ! If there is no connection with the BT module, the number of operating hours cannot be deleted. .

5. MAP - switching to the navigation program

After short pressing this button, the Open CPN application is launched, that allows sea navigation after obtaining available water navigation maps.

After long press is possible to choose to launch any other map application installed on the device..

6. SETTINGS - configuration of the main system parameters



After pressing this button, the screen showing the system configuration parameters appears:

a. Bluetooth - searching and pairing. By default, the screen with the converter module are already paired and should connect to each other after turning on the power.

If the connection was not established, turn off and on power supply of the Bluetooth Module, tap Search on the Bluetooth Page. On the list of devices found, choose device named Flow XXXX (XXXX- the number printed on the bottom side of Bluetooth Module) tap Connect button and ready.

b. language selection:

- Polish
- English
- German
- French

c. sensor configuration. You can choose from:

- fuel type: petrol or diesel
- sensor size: S, M, L, XL, XXL, C
- number of engines: 1 engine or 2 engines

d. averaging constant:

- 5sec.
- 10sec,
- 15sec,
- 20sec.

e. selection of units:

- km / h, l
- knots, l
- knots, gal UK
- knots, gal US

f. flow correction: selection of the value of the multiplier correcting the fuel consumption indication in the event of

discrepancies in indications with actual consumption. Range 0.7-1.3. Factory set to 1.0
Editing of the correction is possible after holding the Set button for a few seconds.

Attention ! If there is no connection with the BT module, the correction settings cannot be changed

g. ZOOM settings: select which parameters should be displayed on the combi screen

h. additional settings: selection of which parameters are to be displayed in fields 5 and 6 of the screen main. You can choose from:

- voltage
- range
- RPM 1
- RPM2
- temperature (option in preparation)

and selection of a tachometer multiplier in the range of 0.5P - 24P allowing to adjust the RPM indications to the actual engine revolutions for various types of engines.

Click anywhere on the screen to leave the Settings tab.

ATTENTION !

When editing the settings, the selected settings should be consistent with the real properties of the engine (s), such as power and fuel type.

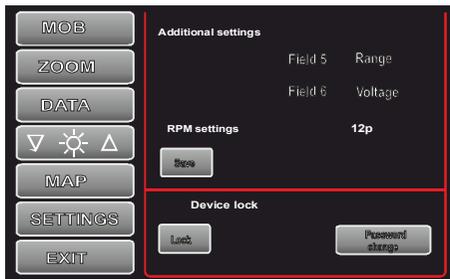
The most important parameters are factory set and should not be changed without taking into account their influence on the correctness of the device indications. For example, selecting diesel fuel for a gasoline engine will result in an error of 10-20%. It is best to protect yourself against unwanted changes to the settings by enabling the setting lock described below.

.

i. device lock

To prevent the device settings from being changed by unauthorized persons, it is possible to turn on the settings lock by setting a password that allows you to lock and unlock access to the settings.

After activating the lock, all operational indications are displayed normally, but it is not possible to view and edit any of the setting parameters. Only after entering the correct password consisting of max. digits, you can change the settings.



Lock activation screen

The lock is activated by holding the Settings button for min. 2-3 sec. until the following screen appears:



Settings lock screen

Using the keyboard, enter the password and confirm its correctness. From this moment on, the device functions normally, counting and indicating all measured values, however, any change in the Settings panel is not possible.

7. EXIT - closing the application

The "EXIT button" has a double function. Either it turns off the device, keeping all measured parameters and settings (short press) or changes the application window to a small, transparent clean field that displays speed and fuel consumption. This field appears on the screen as a sliding overlay visible on top of any other running application, e.g. a map.

This allows you to simultaneously navigate on the map and track fuel consumption. To activate this window, press and hold the End button for a few seconds. To return to the large application window, hold down the rolled arrow visible in the left corner of the overlay field.

To close the application completely, press the cross in the upper right corner.



Screen with the Flowtreks application window visible

Description of the main screen indications

1. Time

In the upper part, the current time is displayed based on the GPS signal. If the displayed time does not match the real time, change the time zone in the Android time settings.

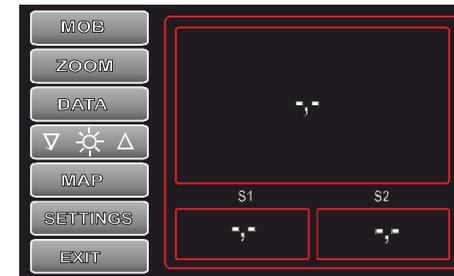
2. Speed

This field of the screen displays the current speed calculated from the data from the satellites. If only dashes are visible, it means no valid satellite signal.

3. Fuel consumption

It shows the current amount of fuel consumption measured by the sensor. This value is averaged to increase the stability of reading indications.

In the case of using several sensors, i.e. for 2 gasoline engines and one or two diesel engines with fuel return, it is possible to view the indications of individual sensors. Hold for a moment the field in which the fuel consumption is indicated and the screen will switch to displaying data from each of the sensors separately. The screens for 2 and 4 sensors are shown below.



Screen for 2 sensors



Screen for 4 sensors

The side fields show the values from each of the sensors, while in the middle the difference (for diesel engines) or the sum (for petrol engines) of the readings from the sensors.

4. The number of kilometers from 1 liter

Indicates the number of kilometers that can be travelled burning 1 liter of fuel. This value is averaged to increase the stability of reading indications. It is one of the most important parameters determining the economy of fuel consumption. Its size is influenced by many factors. By appropriately setting these factors, it is possible to improve this indicator by 50%, which means that the operating range can be doubled by changing important parameters accordingly.

5. Voltage

Indicates the currently measured value of the 12V supply voltage.

6. RPM 1 (RPM 2)

Indicates the currently measured engine speed. In order for the RPM readings to be consistent with the real RPM, you should choose a right conversion factor for the tachometer. It is best to do it at idle speed, which is usually in the range of 700-900 revolutions. On the running engine in the Settings tab, change the RPM multiplier so as to obtain the RPM reading in the above range. The speed of 2 motors can be displayed simultaneously.

6.a Range

Indicates the current range based on the amount of fuel currently in the tank and the current fuel consumption. Of course, in order for this indication to be consistent with the actual range, when refueling, enter the Fuel quantity in the Settings(a number consistent with the actual amount of fuel in the tank).

7. The amount of fuel

Indicates the amount of fuel left in the tank, minus the amount of fuel consumed, measured by the sensors. This value is burdened with a measurement error of the flow meters of 5%. To change the amount of fuel currently in the tank, press the field in which the amount of fuel is displayed. You will then see the following screen with the keyboard visible for entering fuel quantity:



Using the keyboard, enter the correct value and save it. The amount entered is added to the amount already in the tank, so the amount of fuel indicated is increased.

Attention ! When there is no connection with the BT module, the amount of fuel cannot be saved.

Installation.

1. Mount the BTA-3 converter near the sensor installation site, in a position with the cables extending downwards.
2. Install the flow sensor (sensors) on the fuel line, remembering that it should be located away from hot engine parts, and so that it is not exposed to forces and vibrations caused by a running engine. In addition, the sensor should be above the fuel tank to prevent fuel leakage in the event of leakage in the fuel lines. After cutting the fuel line between the fuel filter and the engine, put its ends on the fuel sensor connectors, paying attention to the compliance of the fuel flow direction with the arrows on the sensor body and secure with bands against slipping. Next, insert the BT converter socket from the appropriate sensor into the plug on the sensor cable and attach the sensor with the fuel lines in a horizontal position, i.e. so that the fuel lines extend horizontally, and the Top Side inscription is visible on the upper surface of the sensor, also lying horizontally. When installing a sensor on the fuel return, the same principles should also be followed. After connecting the sensor, check the tightness of the fuel lines.
3. Connect the green wire (RPM 1) coming from the BTA-3 converter to the existing tachometer or RPM limiter according to Fig. Note. No RPM limiter is needed for injection engines and the RPM cable can be connected directly to the tachometer or RPM pulses from the handle. For Diesel
4. Connect the 12VDC power supply to the converter. When properly connected, the blue LED indicator in converter housing should start blinking. Red wire +12 VDC, black wire - ground (GND)
5. Mount the screen on the desktop.
6. Connect the 12VDC power supply to the screen. Turn on the screen with the button at the top of the housing. Wait for the application Flowtrecc will start up on the screen. The Bluetooth connection with the converter will be established automatically and the (values) readings change to white. If the connection was not established, turn off and on power supply of the Bluetooth Module, tap Search on the Bluetooth Page. On the list of devices found, choose device named Flow XXXX (XXXX- the number printed on the bottom side of Bluetooth Module) tap Connect button and ready.

ATTENTION DIESEL ENGINES USERS

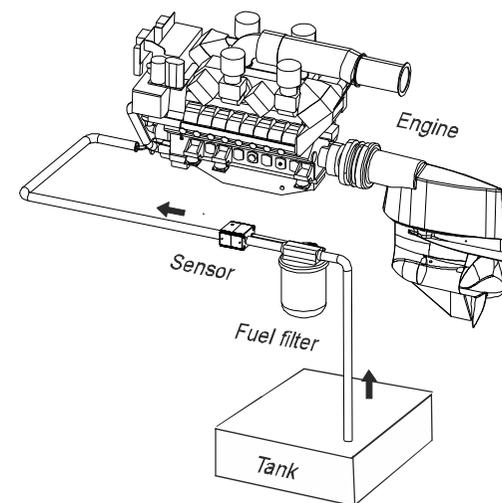
RPM readings may require additional Hall sensor which are not included.

Depending on condition of your engine feeding pumps and injectors some additional components like one-way valve and dumpers could be necessary. They are available separately.

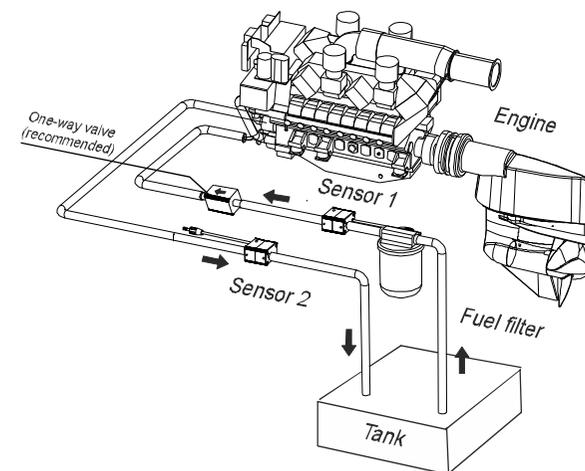
ATTENTION !

When connecting or disconnecting sensors, power off the device

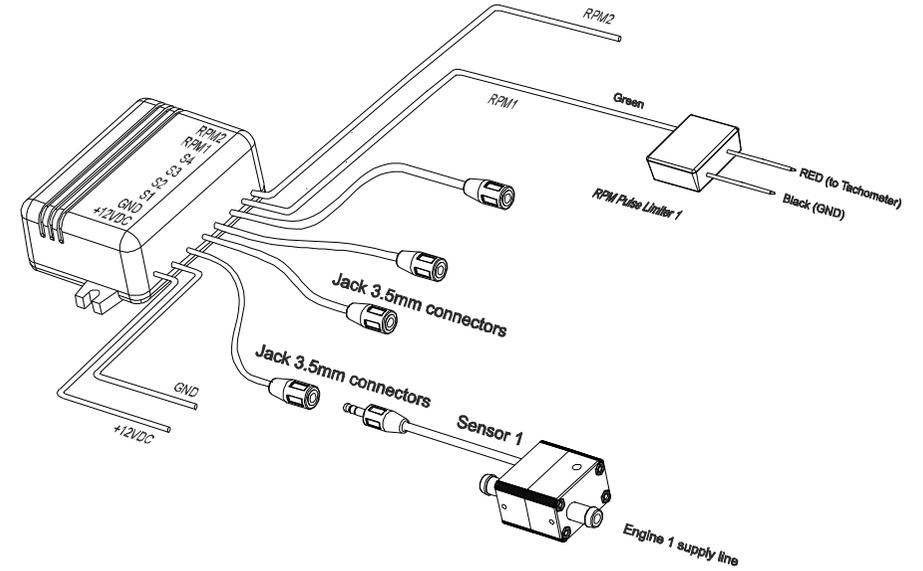
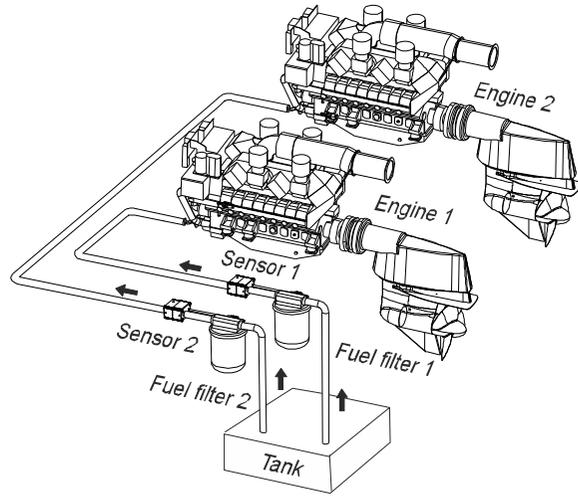
Installation example for 1 gasoline engine (without fuel return)



Installation example for 1 diesel engine (with fuel return)

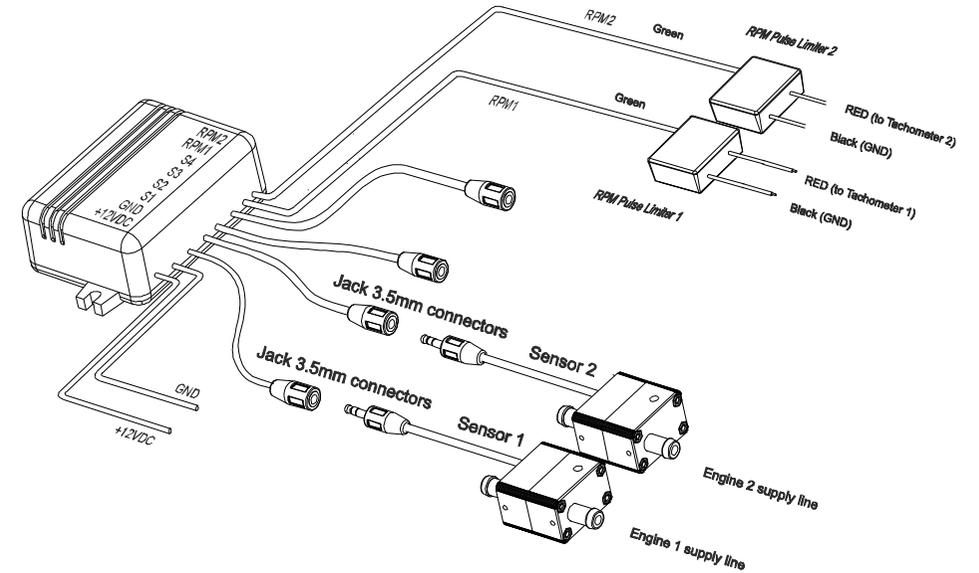
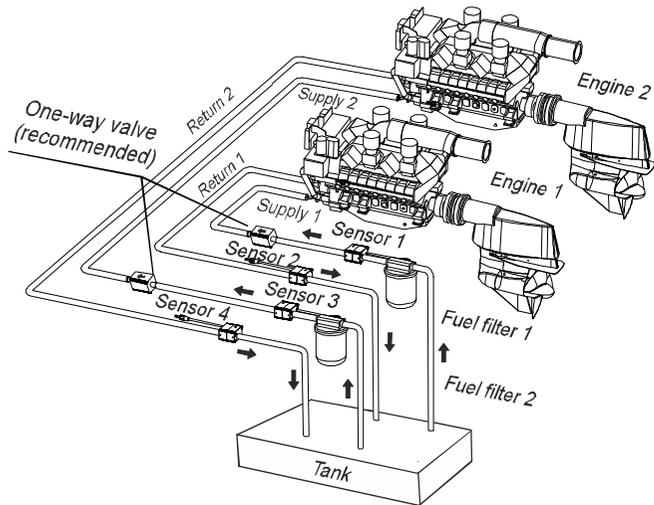


**Installation example for 2 petrol engines
(without fuel return)**

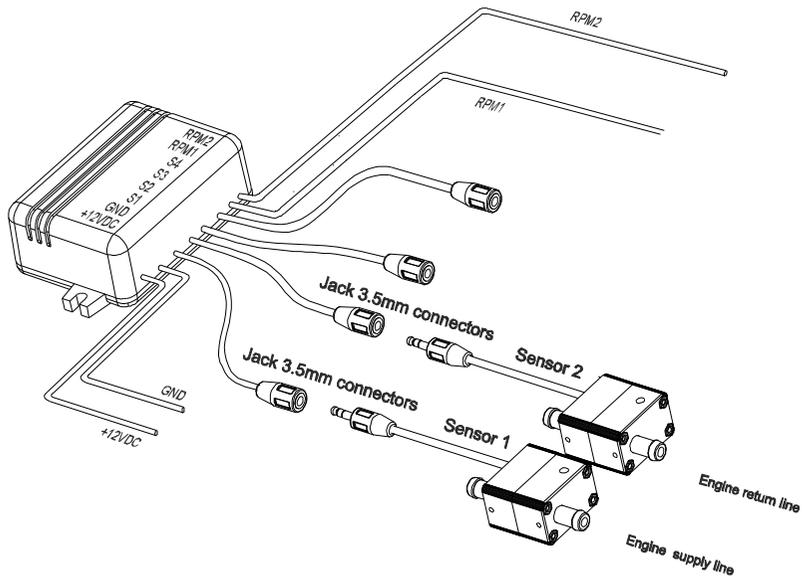


Connections for 1 gasoline engine (without fuel return)

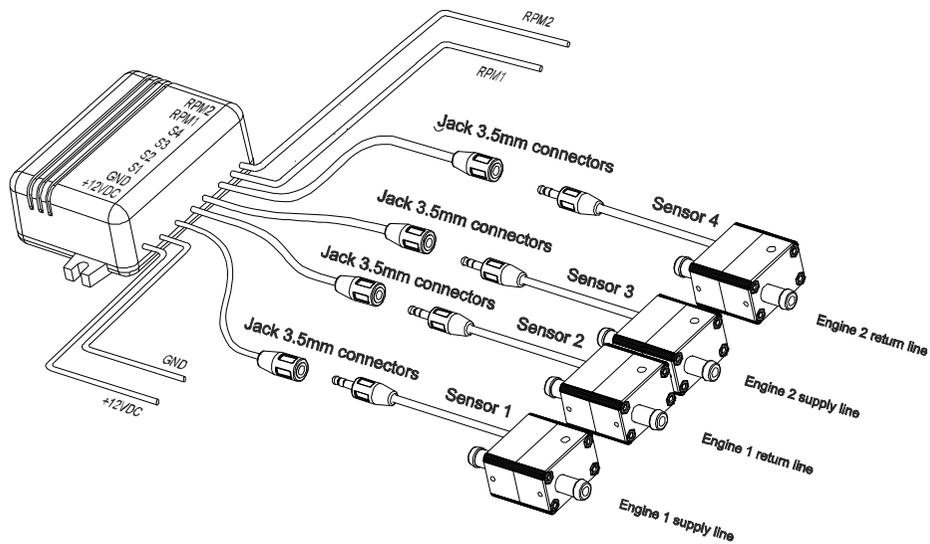
**Installation example for 2 diesel engines
(with fuel return)**



Connections for 2 gasoline engines (without fuel return)

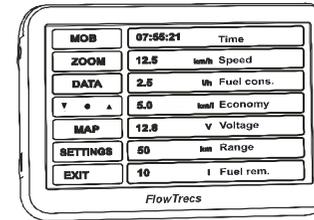


Connections for 1 diesel engine (fuel return)

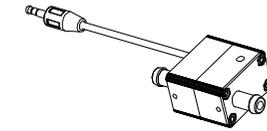


Connections for 2 diesel engines (fuel return)

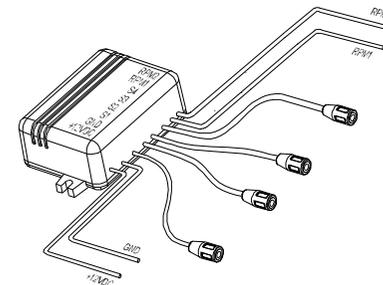
View of the components of the Flowtrecs BT system



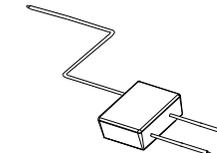
Screen TFT 5"



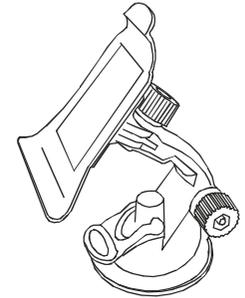
Sensor



Converter BTA-3



RPM limiter (option)



Mounting Bracket

Flowtrecs Android BT - variants

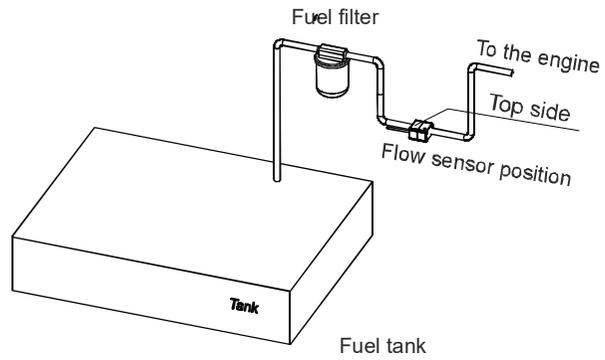
The following models are available with different maximum measuring ranges of fuel consumption, and therefore intended for engines with maximum power shown in the table:

Device type	S version	M version	L version	XL version	XXL version
Engine power range	20-60HP	60-130HP	130-250HP	250-350HP	350-500HP
Power supply	10-16VDC	10-16VDC	10-16VDC	10-16VDC	10-16VDC
Current consumption	0,8A	0,8A	0,8A	0,8A	0,8A
Measurement range (for Gasoline fuel)	0.5-20l/h	1-35l/h	1,5-90l/h	2-120l/h	3-200l/h
Measurement error	5%	5%	5%	5%	5%
Connector diameter	9,5mm	9,5mm	9,5mm or 12mm	12mm	12mm

Recommended position of fuel sensor (inside U-Loop)

Attention:

When connecting the fuel lines to sensor remember to keep appropriate fuel flow direction !
See arrow on the case.



Technical data:

Model :	Flowtrecs BT
Power supply :	12-15 VDC
Current consumption:	0.8A max
Channels:	6
Measurement ranges	0.5-20l/h (S), 1-35l/h (M), 1,5-90l/h (L) 2-120l/h(XL), 3-200l/h (XXL)
Measurement error	<5%
BT operation range	5-10m