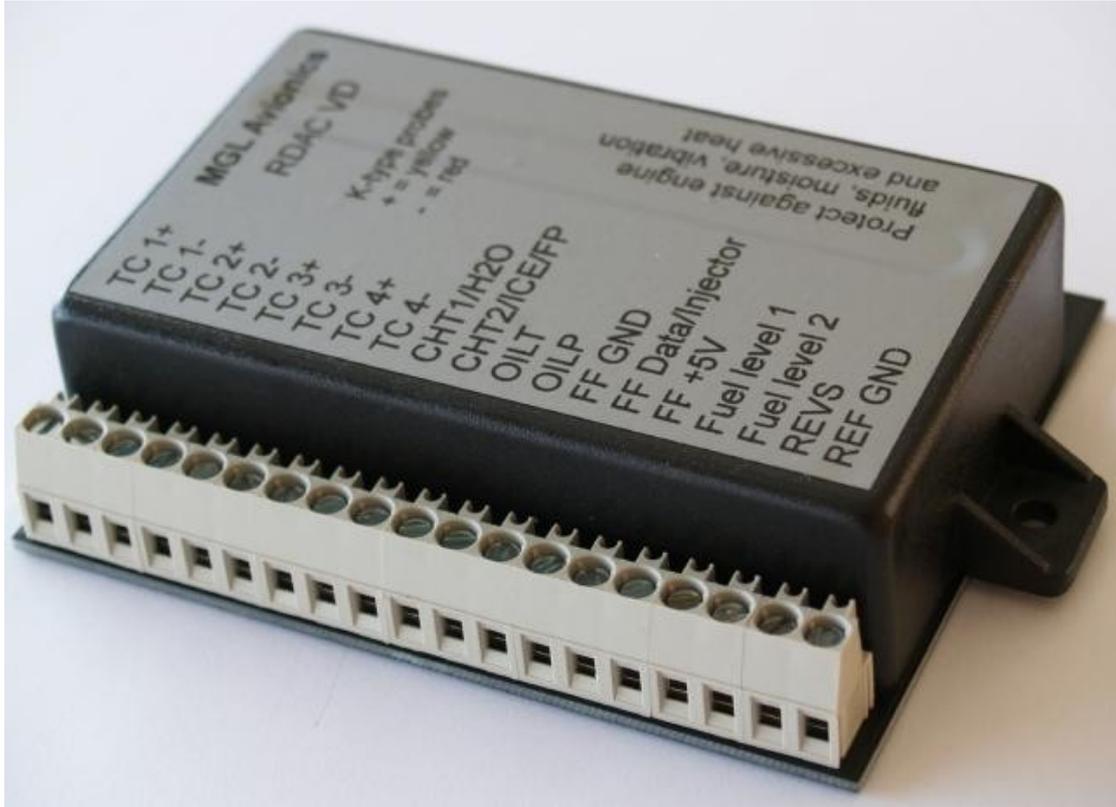


# RDAC VD

## Technical installation document



## **RDAC VD – general**

The RDAC model VD is an integrated, microprocessor controlled engine monitoring subsystem.

It is intended for installation close to the engine, inside the engine compartment thereby eliminating the need for long probe and sender wires.

The VD provides the following functions:

4 x EGT and/or CHT thermocouple inputs

2 x analogue inputs intended for NTC type temperature senders

1 x oil temperature sender input (NTC or semiconductor types)

1 x oil pressure sender (resistive types)

2 x fuel level inputs (resistive types or active capacitive probes with low impedance voltage output from 0-2.5V)

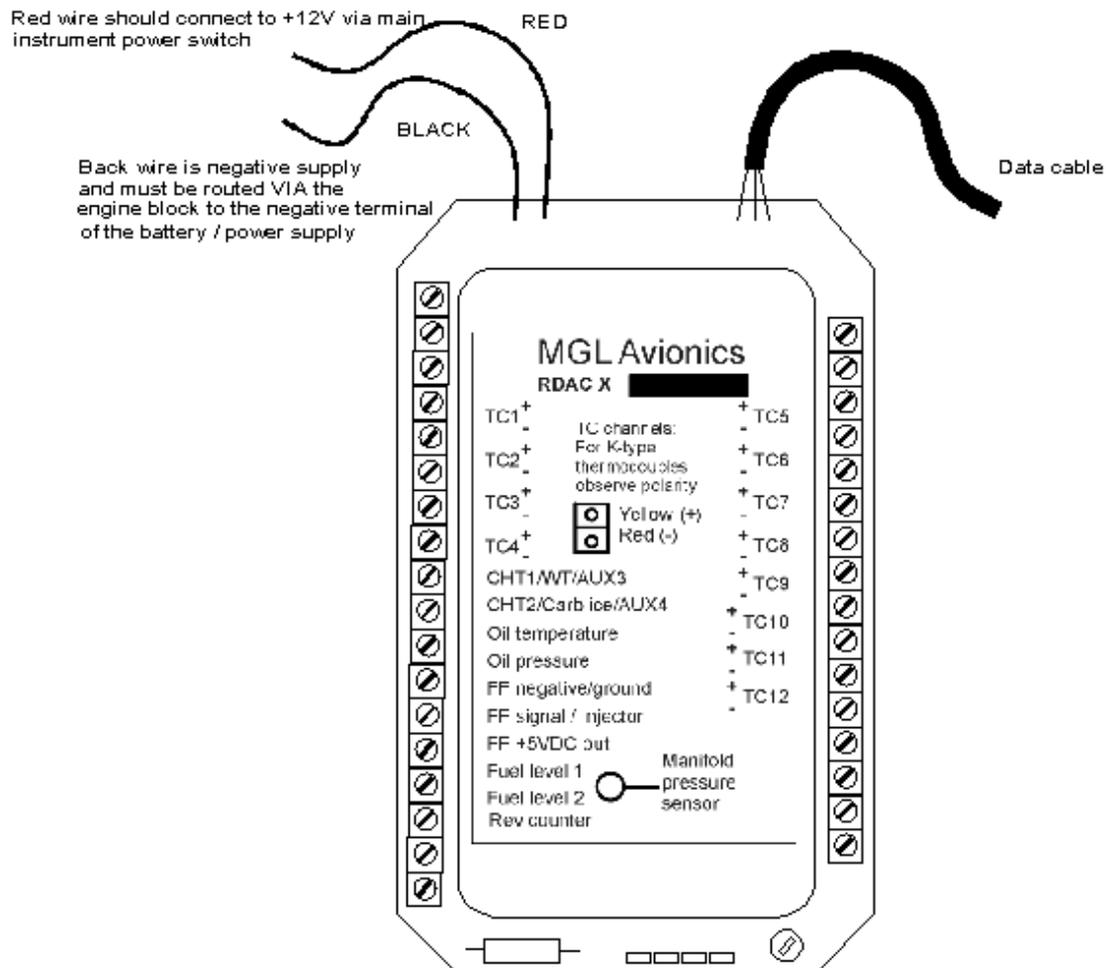
1 x fuel flow sender input, can also be used to measure injector opening times on fuel injected engines to derive indirect fuel flow measurement.

1 x variable sensitivity RPM input

The RDAC VD is intended for installation on all engines where up to four thermocouple senders are sufficient. For larger engines, please review our larger RDAC models.

The RDAC VD is a good choice for engines such as most two stroke engines, Rotax 912/914 engines and smaller two cylinder four stroke engines.

## The RDAC VD power supply and data cable connection



### RDAC VD Power supply

The RDAC VD requires supply from a 12V DC source. Voltages such as found in typical 12V nicad or lead-acid battery based installations are acceptable. The RDAC VD is designed to operate from 8VDC to 18VDC. Should your aircraft have a 24/28V system, you need to provide a 12V preregulator.

In order to achieve maximum accuracy, it is important to route the power supply wiring correctly.

It is important that the ground terminal connection is routed in as sort as possible manner to the engine block. The engine block must have a connection to the negative of the battery.

Normally this connection is provided in the form of a heavy duty cable to allow for the considerable currents of an electric starter motor.

Should your installation not have electric start, you will still need to provide this connection.

Do not route the ground wire directly to the battery minus. This can lead to false readings on some senders. The ground wire must be routed to the engine block. You must have a connection from the engine block to the battery minus.

The red wire from the instrument connection is to be connected to +12VDC. This connection would normally be provided via your instrument. Do not connect 12V to this line if you are using any of our instruments. Our instruments provide the 12V connection via the included grey multicore cable.

### **RDAC VD function indicator**

The RDAC VD has a red LED that will flash in an approximate 0.5-1 second interval if power has been supplied and the RDAC is functioning.

Note: If you have not connected the ground terminal to the engine block and the engine block does not have a ground connection to the battery minus then the LED will not flash and your RDAC will not operate.

### **RDAC VD communications link**

The RDAC VD has a serial data communications link that is optically isolated, i.e. it has no electrical connection to the RDAC electronics itself.

This prevents any form of electrical current flowing in this cable in case of an electrical wiring fault in your aircraft, in particular ground faults.

Connect the wire as indicated by color code on the rear of your instrument.

You have three connections:

Braid – electrically connected to ground by your instrument.

Blue – the data line. Inverse polarity compared to RS232.

Red – connected to +12V by the instrument. Used to power a pull-up resistor on the blue wire and provide the positive power connection to the RDAC.

### **RDAC VD jumpers**

The RDAC VD has two jumper connection marked “TC cal” and “Amb cal”. These jumpers can be used to calibrate your RDACs thermocouple amplifier should this ever be required.

Calibration procedure:

Remove all thermocouples from the RDAC, leave thermocouple inputs unconnected.

Switch your instrument on and observe the temperature reading on the thermocouple channels. This temperature should read very close to ambient temperature (perhaps slightly above by a few degrees if the RDAC has been operating for a while). To calibrate, close the jumper using a pair of small

tweezers. After a short while you will see the ambient temperature reading increase and after a while it will start at a low temperature, increasing as long as you keep the jumper closed. When the indication is correct (about 2-4 degrees above ambient), remove the jumper.

Calibrating the thermocouple amplifier requires an exact 2.49mV DC source with low impedance connected to TC1. Once you have connected this source, verify that you have 2.49mV exactly on the TC1 terminal using an accurate millivolt meter.

Now close the "TC cal" link. After a short while you will see the indicated temperature on TC1 drift towards a temperature reading that is 600 degrees Celcius plus ambient (for example, if your ambient temperature reading on the RDAC is 20 degrees, the reading will be adjusted for 620 degrees).

Once the correct target temperature has been reached, you can remove the link. This calibration adjusts TC2 to TC4 as well.

## **Installation of the RDAC VD**

The RDAC VD must be installed with the following requirements met:

- a) The RDAC must not be exposed to direct engine vibrations. Never mount the RDAC on the engine itself. Mount the RDAC on on the aircraft's firewall or similar suitable structure.
- b) The RDAC must be installed so extreme heat from the engine cannot damage it.
- c) The RDAC must be mounted in a position where it is protected from any engine oils or other engine fluids including water.
- d) If required the RDAC should be mounted inside a protected enclosure if it is otherwise not possible to protect it from environmental exposure such as rain.
- e) All wires to the baseboard must be secured such that it is not possible for any wire to be damaged due to chafing or that any wire can loosen itself from its connection terminal.
- f) If the RDAC is operated in conditions that may lead to corrosion of exposed electrical metal parts, suitable protection is a mandatory requirement.
- g) The RDAC includes very good protection against voltage transients on the power supply. However, in cases where severe transients containing a large amount of energy are expected, additional, external protection may be required.
- h) All signal connections that terminate in any of the RDAC terminals must never be allowed to contain dangerous high voltages such as can be created by ignition systems or inductive devices. In particular never route such cables alongside HT ignition leads.

## **RDAC VD principle wiring diagram**

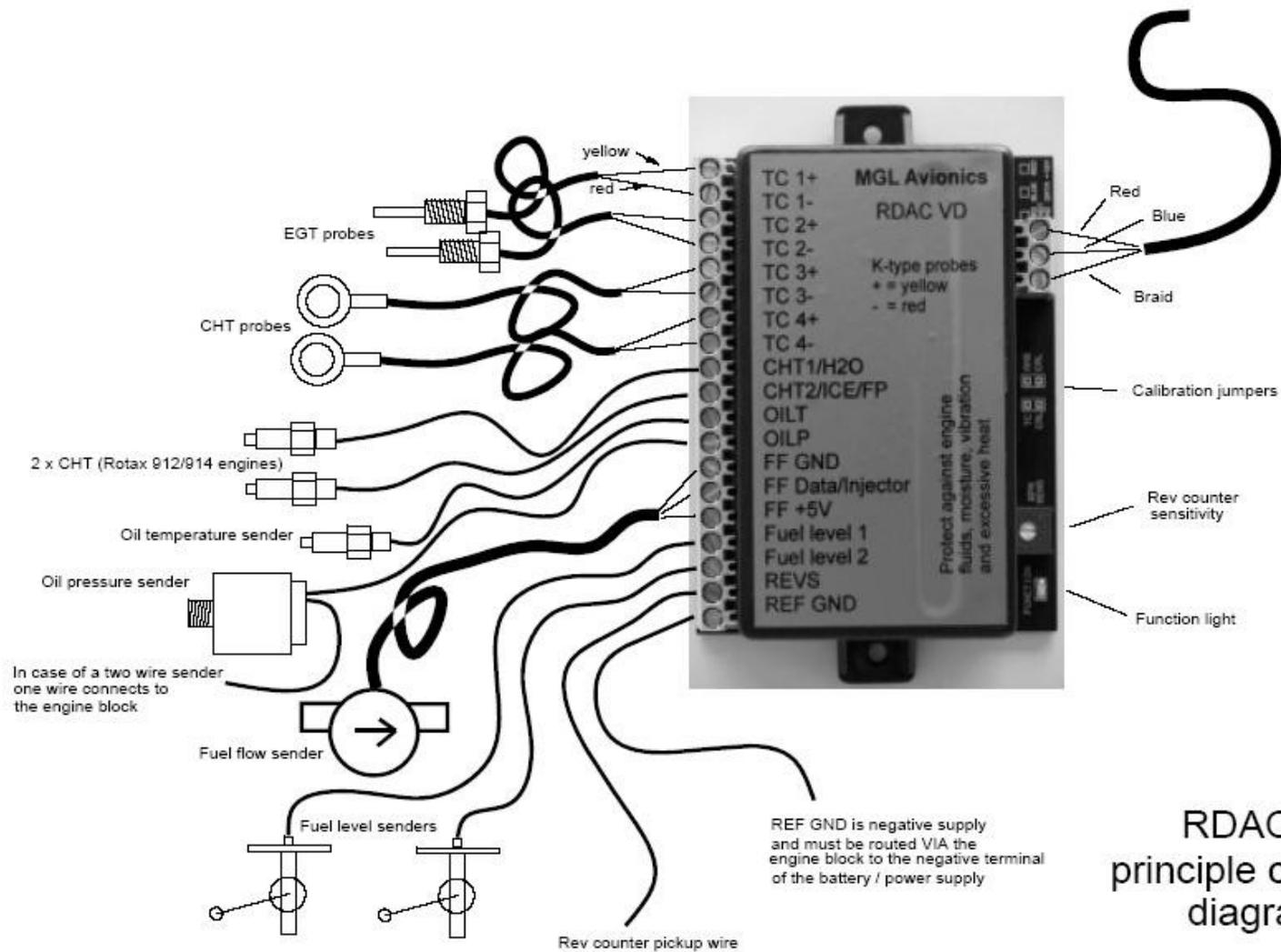
The following diagram shows a basic connection sample for various sensors. The actual connection of sensors depends on your application and setup in the display unit (instrument).

Normally, in cases of multiple EGT/CHT thermocouple sensors, EGT sensors start from TC channel 1 while the CHT channels follow.

The starting channel for CHT channels depends on your instruments setup.

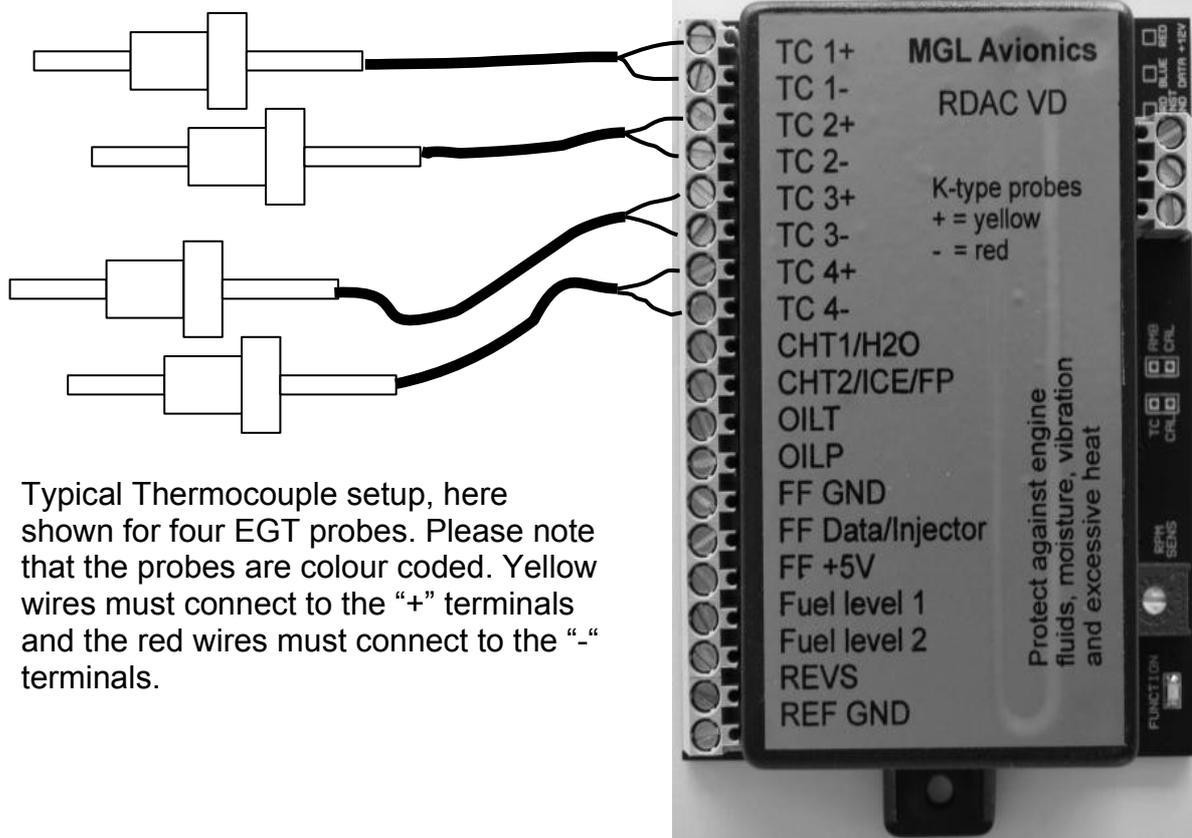
CHT1/H2O is used for either a NTC type water temperature sender or the CHT probe of a Rotax 912/914 engine.

CHT2/ICE/FP is used for a LM335 based ice warning sensor or the second CHT probe of a Rotax 912/914 engine or a fuel pressure sender.



RDAC VD  
principle connection  
diagram

## RDAC EMS unit thermocouple inputs



Typical Thermocouple setup, here shown for four EGT probes. Please note that the probes are colour coded. Yellow wires must connect to the “+” terminals and the red wires must connect to the “-“ terminals.

## Thermocouple inputs – details

The RDAC VD EMS provides for up to 4 thermocouple inputs for use with EGT and CHT probes. Both K as well as J type probes can be used. K types are used for EGT probes while most CHT probes are also K types. Some makes of CHT probes are J type.

Probe types are selected in the sender setup menu of your instrument. Important: Incorrect selection will lead to incorrect temperature display.

The RDAC VD EMS will accept both grounded and isolated thermocouple probes. Your only consideration in case of the more common grounded configurations is that you need to ensure that the thermocouple mounting position (Exhaust flange, etc) is at the same electrical potential as the negative supply line of the RDAC VD (REF GND).

Probe usage depends on your setup and kind of your instrument.

Usage of thermocouple inputs with various display units:

## RDAC VD thermocouple guidelines

The thermocouple amplifier is a precision device providing full cold junction compensation and bow voltage correction. In addition the amplifier measures

and corrects for its own errors. This results in very accurate measurements providing you install high quality probes. Here are some guidelines:

**EGT Probes:** select probes that are made from 316 stainless steel and that use glass-fiber insulated conductors. Teflon insulated conductors as found in many cheap probes introduce errors as the insulation melts moving the measuring point towards the mounting bolt which transfers a lot of heat to the exhaust material. This results in under reading probes. Stay away from probes that use simple plastic heat shrink sleeving – it does not last. Choose probes that use a generous amount of stainless steel spring as strain relief. The Bolt itself should be stainless as well or it will rust very quickly.

**CHT probes:** These are made from washers to fit spark-plug bases. Temperatures are considerably lower so most thermocouple cables will work without problems. The biggest area of concern should be the connection of the thermocouple cable to the washer. This often breaks after the spark plug has been changed a few times. Choose a probe that is suitably reinforced at this point for a long and trouble free life.

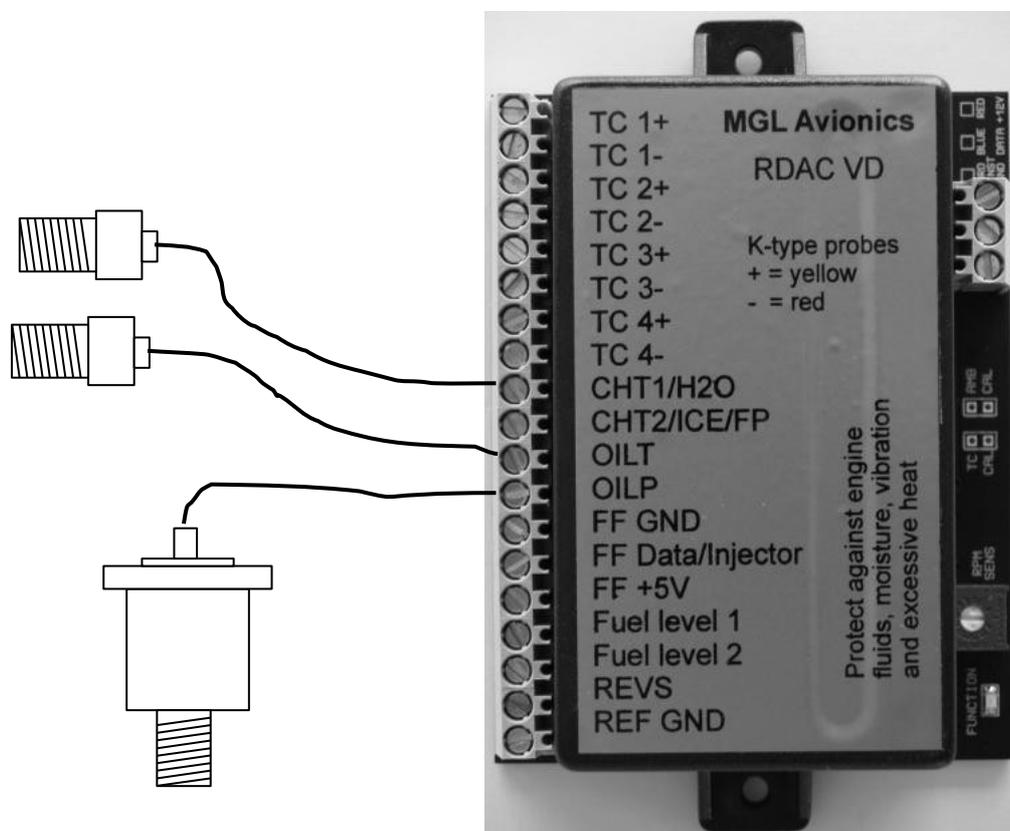
EGT and CHT probes supplied by MGL Avionics are of highest quality. We recommend that you consider using our probes if at all possible.

**Warning:** Four stroke engines produce much hotter exhaust gases compared to two stroke engines. Do not use EGT probes made from lower grade stainless steel (for example 310), these probes will not withstand the high temperatures and can fail as the metal gets very soft at 800 degrees C. Many four strokes (such as the Rotax 912) will produce exhaust gases of up to 850 degrees C.

**Important installation note:**

EGT and CHT probes use wire made from plain Iron and other basic metals. As a result these probes are not able to withstand much flexing of the wires due to engine vibrations. Avoid making nice looking coils or similar constructions that will result in excessive vibration or flexing of the wire. Route the cables from the probe points tightly along suitable engine mounting points eliminating any chance of unnecessary wire flexing during engine operation.

## Connecting coolant temperature, oil temperature and oil pressure senders.



This drawings shows the connection of a coolant temperature probe, a oil temperature probe and a oil pressure sender.

Note that all of these probes require a good electrical ground connection to the engine block so they should never be installed using sealant or PTFE sealant tapes. The RDAC VD REF GND connection should also be wired to the engine block.

The RDAC VD supports various types of temperature senders and well as oil pressure senders. These are selected in the relevant sender setup menus of your instrument.

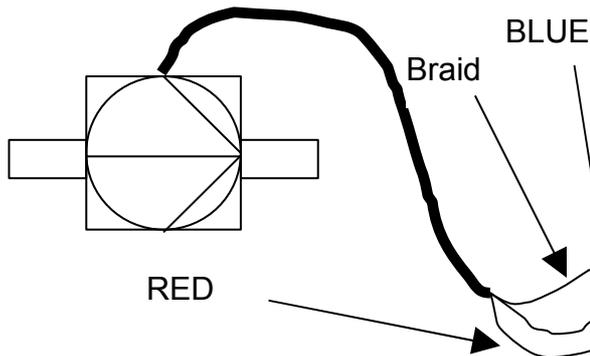
Please note that the CHT1 and CHT2 terminals are used in case of a Rotax 912 or 914 engine to interface to the two built in CHT senders. These senders are standard VDO oil temperature senders.

Coolant and oil temperature senders are mostly NTC resistors. These are resistors that vary their resistance with temperature. These senders come in a wide variety so ensure that the sender you are using is compatible with the instrument and that you have selected the correct probe type in the relevant setup menu.

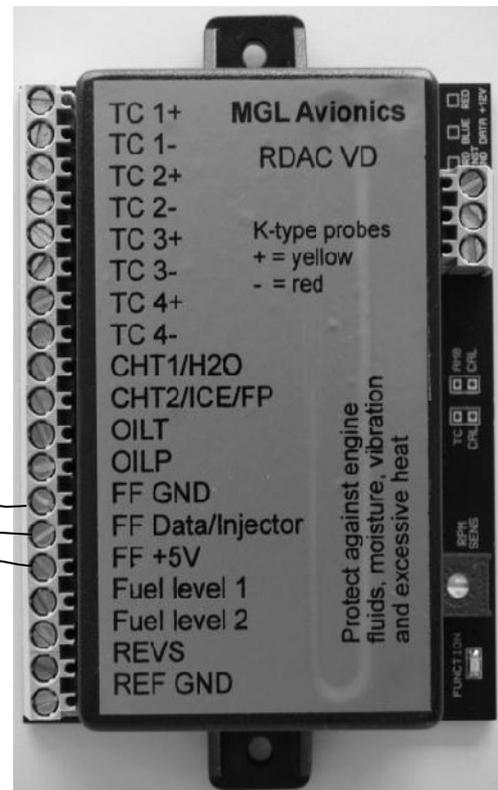
## RDAC Fuel flow sender installation

Note: Direction of fuel flow  
Indicated by arrow on sender

RED wire – Fuel Flow Sender Supply  
BLUE wire – Fuel Flow Sender signal  
Braid – Fuel Flow Sender Ground



Warning: Incorrect wiring can damage  
both the RDAC unit as well  
as the flow sender.

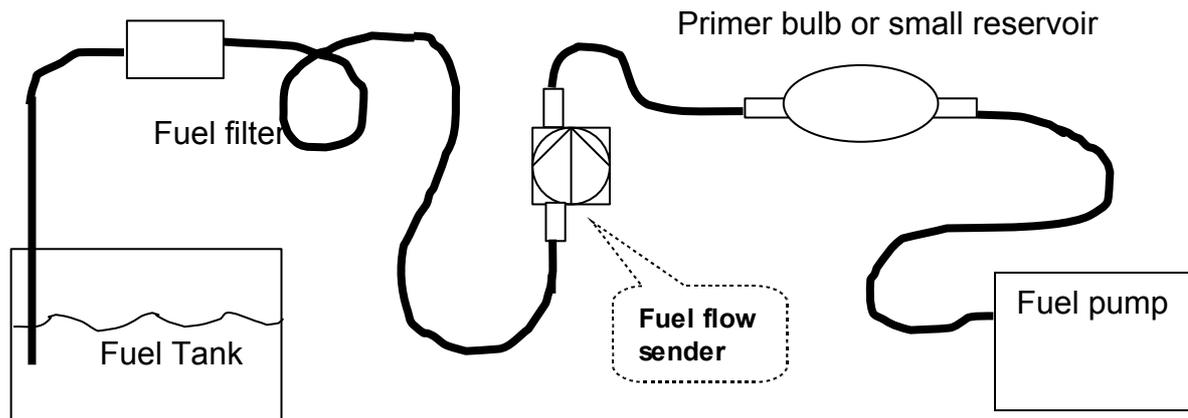


The optional Fuel Flow Sender is highly recommended for use with Stratomaster instruments. It provides instantaneous readouts of hourly fuel usage, and both time and distance estimates on remaining fuel in flight. You can also verify the performance of your fuel pump during the pre-takeoff engine run up – a very valuable check !

Further, it is possible to set up the instruments to calculate Fuel remaining by subtracting fuel used from a value entered when you filled your tank(s).

In this case you may omit the installation of the optional fuel level sender.

Please note that the installation of the Fuel Flow sender should be done in such a fashion that dirt or debris from the fuel tank cannot lodge inside the flow sender. These will not block you fuel flow but may lead to the impeller inside the sender jamming. It is usually sufficient to mount the Flow sender **AFTER** the fuel filter but before the fuel pump. It is a good idea to provide a small reservoir such as a primer bulb between the flow sender and the fuel pump.



As indicated in the recommended fuel flow sender installation drawing, it can be of advantage to install the flow sender in such a fashion that the inlet points slightly down and the outlet points slightly up. This prevents vapor from forming a bubble inside the flow sender.

We strongly recommend to mount the flow sender in such a fashion that the impeller rests on only one bearing. This is achieved if you mount the sender such that the surface with the arrow faces upwards.

Mounting the sender like this results in the best performance at low flow rates as only very little friction is present.

The flow sender is delivered with a small jet that can be installed in the flow sender inlet. Installation of this jet is recommended for engines with fuel flow rates lower than about 30 liters per hour. This would apply to most small two and four stroke engines.

Stratomaster instruments are shipped with the Fuel sender calibration set for the jet installed. In a good installation you can expect about +/- 3% maximum flow reading error with this factor.

You can calibrate the flow sender yourself to a higher degree of accuracy if you so desire.

Recommended procedure to calibrate the fuel flow sender:

Note: You must disable the Fuel Level sender if you have one installed first.

Fill your tank exactly to a known level (for example 50 liters).

Set your fuel level to 50 liters using the Main Menu. If required you may have to disable the fuel level sender first using the Mode Menu.

Fly your aircraft for a period that you know will use approximately 20 liters of fuel. The exact fuel burn is not important, just burn about 20 liters of your fuel. At the end of your flight the instrument should give you a reading of how much fuel you have left – the reading should be about 30 liters left.

Now place your aircraft in exactly the same position that you used when you first filled the tank and refill the tank to 50 liters using a measuring jug. You should find that you need 20 liters of fuel to refill to 50 liters.

If you find that the instrument under or over reads the fuel used, you should perform a simple adjustment of the Fuel Flow sender calibration factor. This is outlined in the Owners Manual.

Example:

Actual fuel used: 21.5 liters, Stratomaster fuel burn calculated 29.7 liters left in tank. This means the Stratomaster measured  $50 - 29.7 = 20.3$  liters. We are under reading by 1.2 liters.

Default calibration factor in Fuel Flow setup (Basic device setup menu) = 7000.

Let the corrected calibration factor be X.

$$X = (21.5 * 7000) / 20.3$$

$$X = 7413.79$$

The closest setting you can enter as factor is 7414. Enter it into the unit and you are done !

Repeat the above procedure to verify that your flow sender is now reading correctly.

**Please note:**

Before you calibrate the flow sender ensure there are no problems with your installation. We find the senders are very accurate if everything is installed and working properly. If your fuel burn indication is out by a large amount you have a problem that you should not attempt to fix by fiddling with the calibration factor !

Please ensure that no fuel vapor can be trapped inside the sender housing in the form of bubbles. Due to the low fuel flow rates the bubbles will prevent the tiny impeller from turning freely, You can verify the turning of the impeller. You should notice three dark spots that are just visible in the inside of the fuel flow sender. These are small magnets that are attached to the impeller. With fuel flowing you should see the magnets turning.

The best defense against vapor bubbles is to install the flow sender in such a way that the bubbles can escape. The easiest way is to point the outlet slightly upwards and the inlet (with the jet) slightly downwards.

Another possible problem is the fuel sender jet. When you install it, do not damage it. Use a drill bit of suitable diameter to push the jet all the way the opening of the jet must be just in front of the impeller.

**YOU NEED TO APPLY SOME FORCE TO INSERT THE JET ALL THE WAY. THE JET MUST BE LOCATED RIGHT IN FRONT OF THE IMPELLOR. YOU CANNOT PUSH THE JET TOO FAR.**

(Fuel flow sender – continued from previous page)

### **Using other Flow Senders**

It is quite possible to use Flow Senders other than the Stratomaster device. In this case ensure that the Sender outputs a 5V TTL square wave or a similar signal. The Stratomaster interface electronics will adapt to a variety of different voltages and pulse shapes as it contains a schmidt-trigger input stage. The calibration factor can be entered in a wide range making the unit particularly suited to other Flow senders.

The supply output terminal for the Sender provides a positive, regulated 5 volt output. This may be used to power the Flow Sender provided the Sender will not draw more than 40 mA of current. Should your sender require a higher voltage or more current, then you must supply the sender from a different power source. Exceeding the rating on the Stratomaster Flow sender supply terminal can affect the operation on the unit negatively or even damage it.

Recommended Calibration Factors for the MGL Avionics dual range flow sender:

With jet installed = 7000. Recommended with flow rates below 30 liters/hour maximum.

Without jet installed = 1330. Recommended with flow rates above 30 liters/hour.

Please refer to the leaflet included with the Flow Sender for information on pressure drop vs. flow rate, wetted materials etc.

**It is your responsibility to ensure that the flow sender used is compatible with the fuels you intend using. We have found the MGL Avionics sender to be very compatible with automotive fuels used in South Africa, many of which contain methanol. 100LL AVGAS also appears not to harm the sender in any way. We have exposed a sender continuously to our automotive fuels for a duration of two years without any noticeable ill effect on the sender.**

**However, despite this MGL Avionics or its appointed agents cannot assume responsibility for any incident or damage, even loss of life by whatsoever cause connected with the fuel flow sender or the Stratomaster Flight Instrument. Usage of this or other senders is your own sole responsibility.**

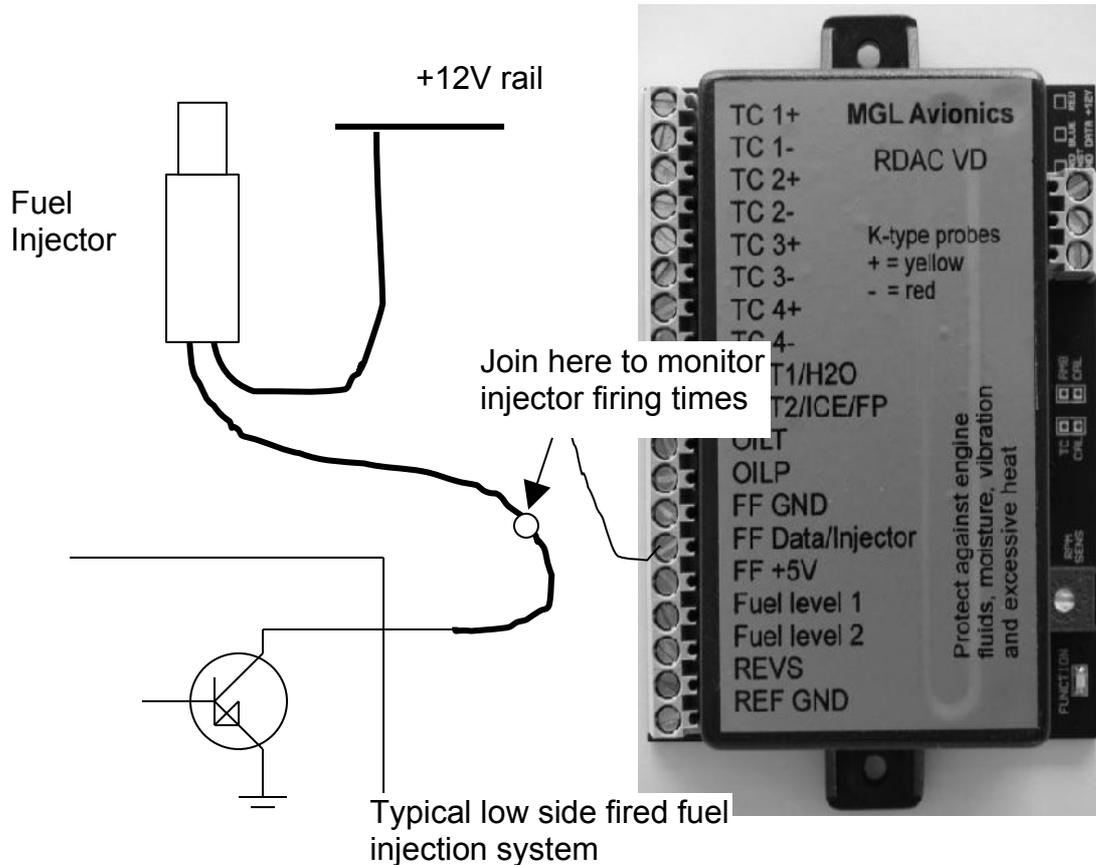
**If you do not agree with the above statement you must not use the fuel flow sender.**

Note to Pilots: (Even though this is the installation manual)

You must always have a visual indication of the fuel level available, either by means of a sight glass, direct tank observation or a known, reliable secondary fuel level gauge. Fuel level indication by means of calculated fuel burn is subject to errors both by entering incorrect starting fuel levels as well as

mechanical problems causing the flow sender impeller to turn too slowly, resulting in under reading fuel burn and thus over reading remaining fuel. As pilot in command of an aircraft it is your responsibility to ensure that you have sufficient fuel to reach your intended destination. Always ensure that you have a generous amount of reserve fuel and never use your reserve fuel except in an emergency if it is unavoidable.

## RDAC Fuel injection system monitoring



Should you want to monitor fuel flow directly by means of measuring the fuel injector opening time, the above arrangement can be used. You can use both high or low fired injectors (most systems are low side fired as shown above).

After you have connected the system as shown above you can proceed to set up the system. (don't forget that you need a connection from the RDAC ground terminal to the engine block (at the same potential as the battery negative)).

- Select high or low side fired injector in the Mode Menu (InjectorH and InjectorL).
- Enable the flow sender in the Mode Menu.
- Select a suitable K-factor in the calibration menu to give you correct rate of flow. A good starting value may be in the 1500-2000 range. Increase to lower indicated flow and decrease to have a larger indicated flow.

Flow through the injectors may not be 100% linear with switching times due to various effects. However, it is possible to obtain very good performance from this flow monitoring system if you keep the following in mind:

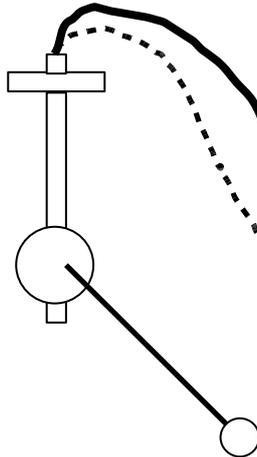
Calibrate the K-factor so flow indication is accurate during cruise, the period your engine spends most of its active time at.

Ensure that you have a correctly working fuel pressure regulator. The more constant your fuel pressure, the more accurate the flow indication.

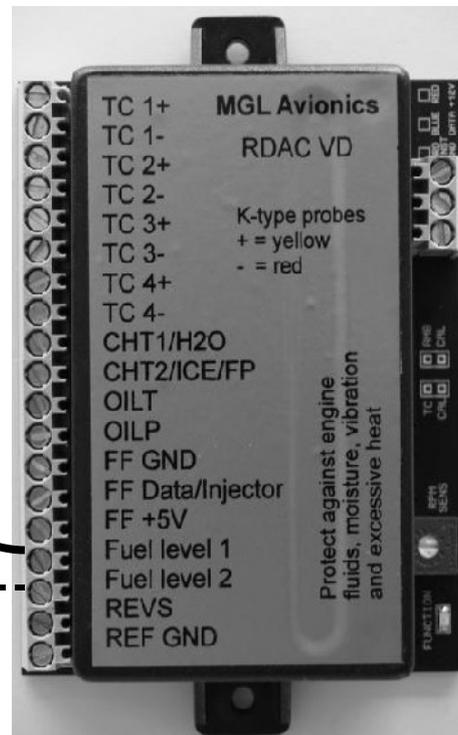
**Never use this or any other flow system as your only fuel level indication. This is not the intended purpose of a flow measuring system and this can be dangerous if for whatever reason incorrect flow is indicated.**

## Connecting fuel level sender(s)

Typical float based level sender  
We recommend VDO senders



Connect flange of sender to negative supply (ground). Dotted connection is for fuel level sender two.



The Stratomaster RDAC VD EMS permits the connection of one or two standard automotive fuel level senders. These senders can be obtained at automotive spares outlets at reasonable cost.

When you choose a float level sender, ensure that you select a model that is sturdy and promises reliable and long lifetime. In particular, select a model that does not have any metal parts that can rust.

The RDAC VD EMS can interface to a large variety of these fuel level senders. It does not matter if the sender resistance increases or decreases with the fuel level as long as it changes. The calibration procedure outlined "Set fuel tank" in the owners manual describes in great detail the procedure to follow.

In essence, the calibration procedure will measure the resistance of the fuel level sender at various fuel levels and then work out the readings in between those known settings.

Typical fuel level senders that can be used with the RDAC VD EMS have resistance ranges in the region of 100 ohms to 500 ohms.

You can connect capacitive senders as well. These generally come in two types: The first emulates a normal resistive probe and is simple to connect and use as a result.

The second type has a voltage level output. These can be used if the voltage can be set to a range of about 0-2.5V. Higher voltage levels will result in the instrument assuming a problem.

The RDAC VD supports one or two fuel tank level senders. You need to enable these in the relevant setup menu of your instrument (usually the mode setup menu).

**Safety Hazard ! Please read this:**

Be careful when installing fuel level senders into fuel tanks. Ensure that the fuel tank is completely empty when you proceed with the installation. Ensure that the fuel tank is well ventilated and does not contain any fuel vapors – these are highly explosive when mixed with air.

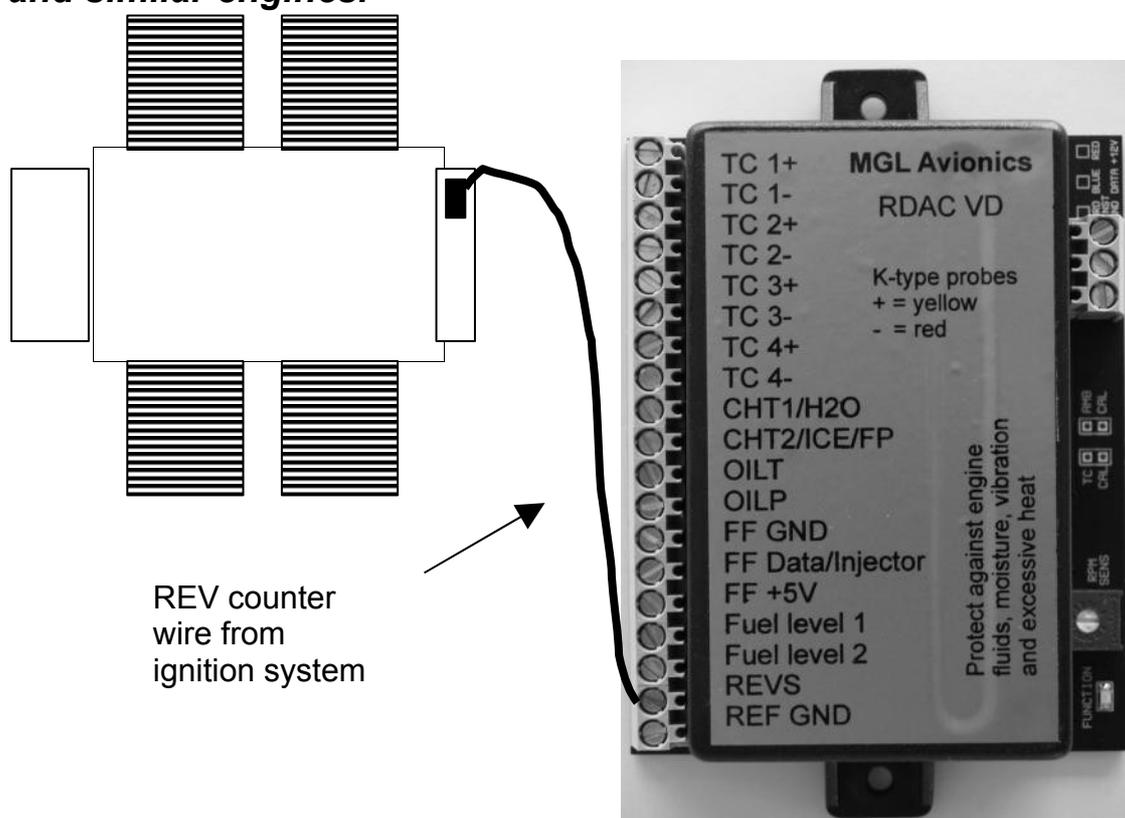
Ensure that at all times the ground connection (the connection of the fuel level sender mounting flange) is securely connected to the aircraft frame (in case of a metal frame) and to the negative terminal of the battery. In addition the negative terminal of the battery must at all times be connected to the Supply ground terminal of the RDAC VD EMS.

Please note – this wiring is critical and must never break in flight. It would be possible to create electrical sparks in the fuel tank if your wiring is faulty or incorrect. The consequences of this can be imagined. This has nothing to do with the RDAC EMS itself but is a general hazard for any automotive fuel level sender installation.

If you have no experience with electrical wiring, **PLEASE** delegate the task to a qualified automobile electrician or electronics technician.

If you need to remove the RDAC VD EMS, please first disconnect and secure the fuel level sender wire before disconnecting anything else.

**Connecting the rev counter  
if used on other magneto systems such as found on Jabiru  
and similar engines.**



After you have connected the rev counter terminal to the signal source you need to set the number of pulses per 10 revolutions in the Calibration Menu. The calibration itself depends on your engine type and what kind of signal you are using. Typical sources are:

Magneto coils (suitable signal at the kill switch).

Primary (low voltage) side of ignition coil, at contact breaker or electronic ignition module.

RPM counter output of electronic ignition systems (for example Bosh Motronic).

RPM pickup devices such as hall-effect sensors on flywheels etc.

Typical calibration settings are 10 or 20 for most engines. Other pulse counts per 10 revolutions are also possible for some engines.

Please note: On some of the Stratomaster instruments pulse counts are entered as pulses per ten revolutions, on others it is pulses per single revolution with a decimal point (i.e. 1.0).

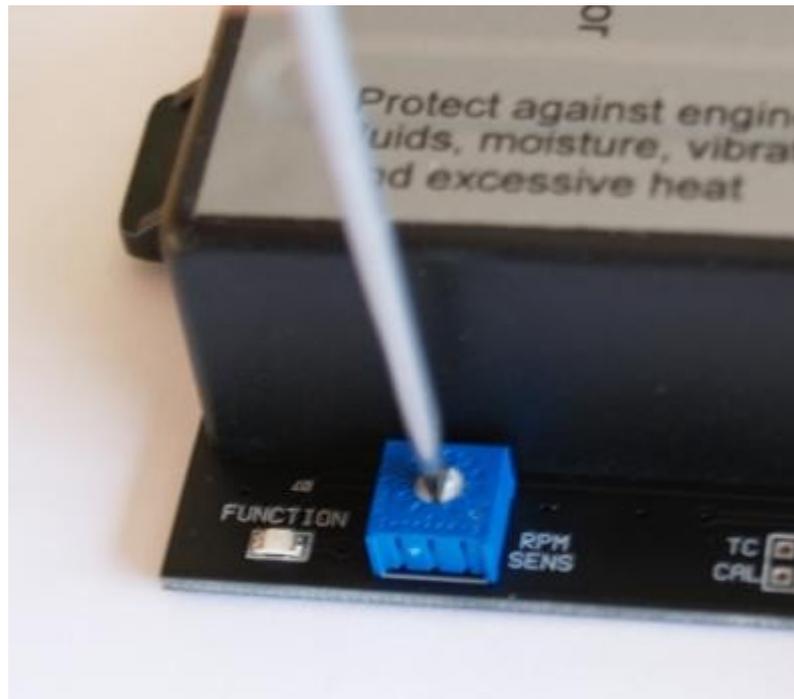
The rev counter input on the RDAC can be used with signals from about 5Vpp to as much as 100Vpp. A noise filter is included that results in the input ignoring any noise signals as long as this is below the detection threshold of about 2.5Vpp. The input impedance of the rev counter input is approximately

10Kohm. You can use series resistors as well as load resistors for applications that have unusual signals.

### ***Adjusting rev counter sensitivity***

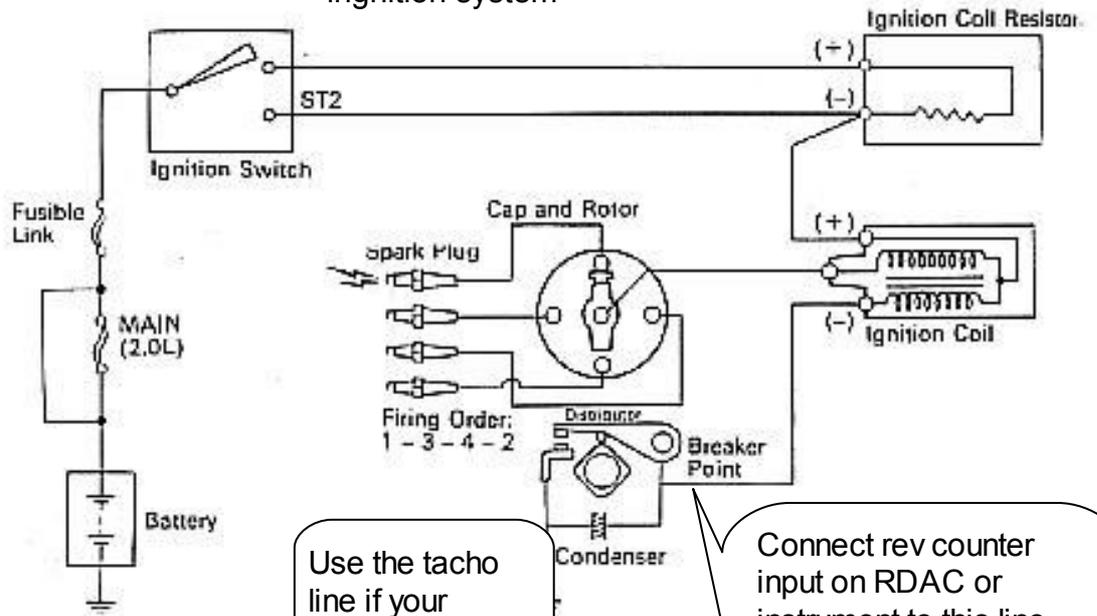
The rev counter has a sensitivity adjustment trimmer as shown in the picture below. Adjust this trimmer using a small screwdriver such that you get stable RPM readings over the entire rev band of your engine.

If your sensitivity is too high, you may get unstable RPM readings (usually at higher RPM as electrical noise in the ignition system increases). If the sensitivity is too low the RPM reading may remain at zero.



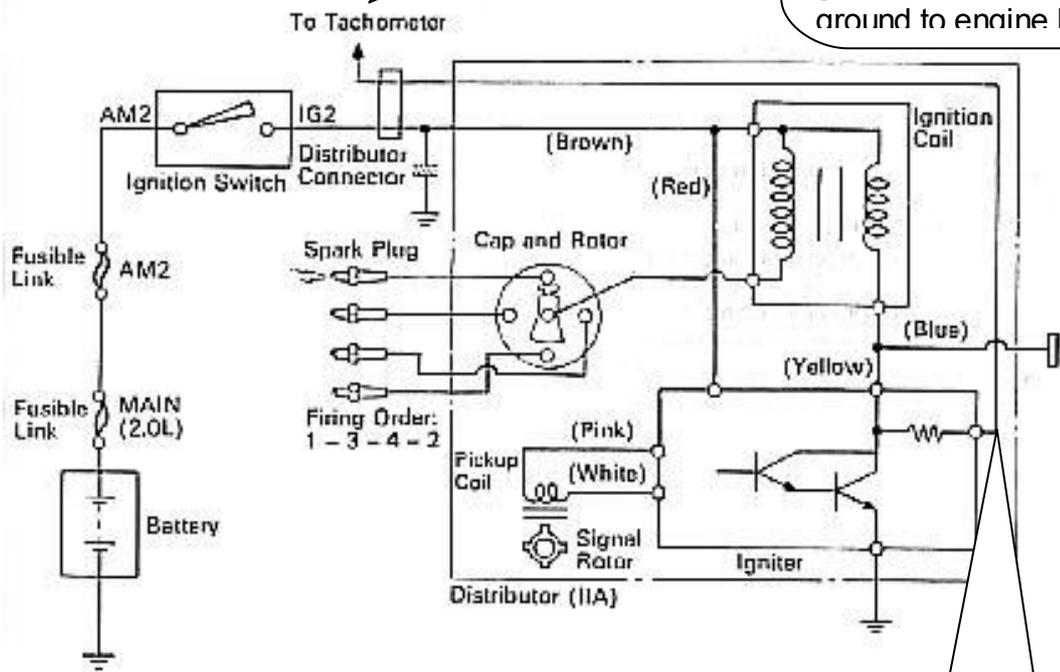
# Rev counter pickup for Stratmaster instruments fitted to automotive engines

Conventional contact breaker ignition system



Use the tacho line if your system has such a signal.

Connect rev counter input on RDAC or instrument to this line. Ensure you have a connection from RDAC ground or instrument around to engine block

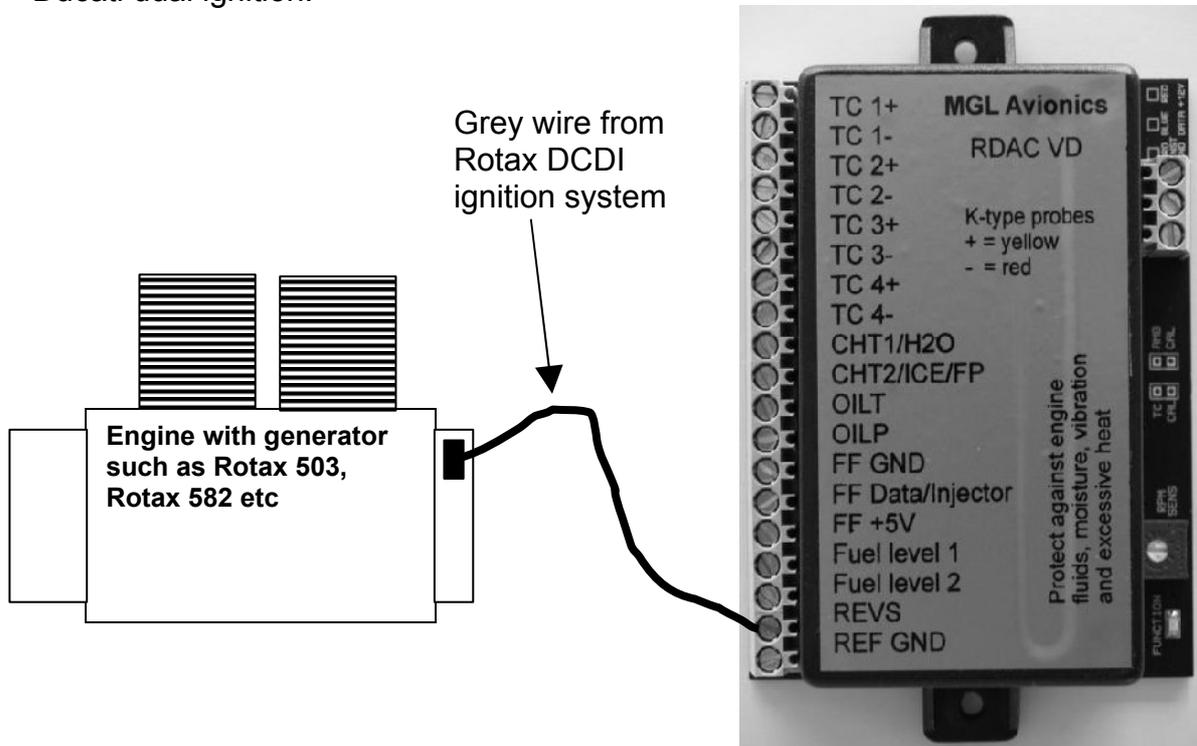


Electronic ignition system with conventional ignition coil

Connect rev counter input on RDAC or instrument to this line. Ensure you have a connection from RDAC ground or instrument around to engine block.

## Connecting the rev counter on a two stroke Rotax

Typical connection in case of a Rotax two stroke engine with Ducati dual ignition.



Most instruments assume as a default that you will be connecting a Rotax with DCDI ignition system. Such a system produces 6 pulses for every revolution of the engine.

Other engines can be used but you must adjust the rev counter calibration setting accordingly (Device basic setup menu).

The value entered is for 10 revs. On some instruments a decimal point is shown in the setup for the rev counter calibration. If you have one of these, enter the number as pulses per revolution. For example, for the Rotax 503 or Rotax 582 you would enter 6.0.

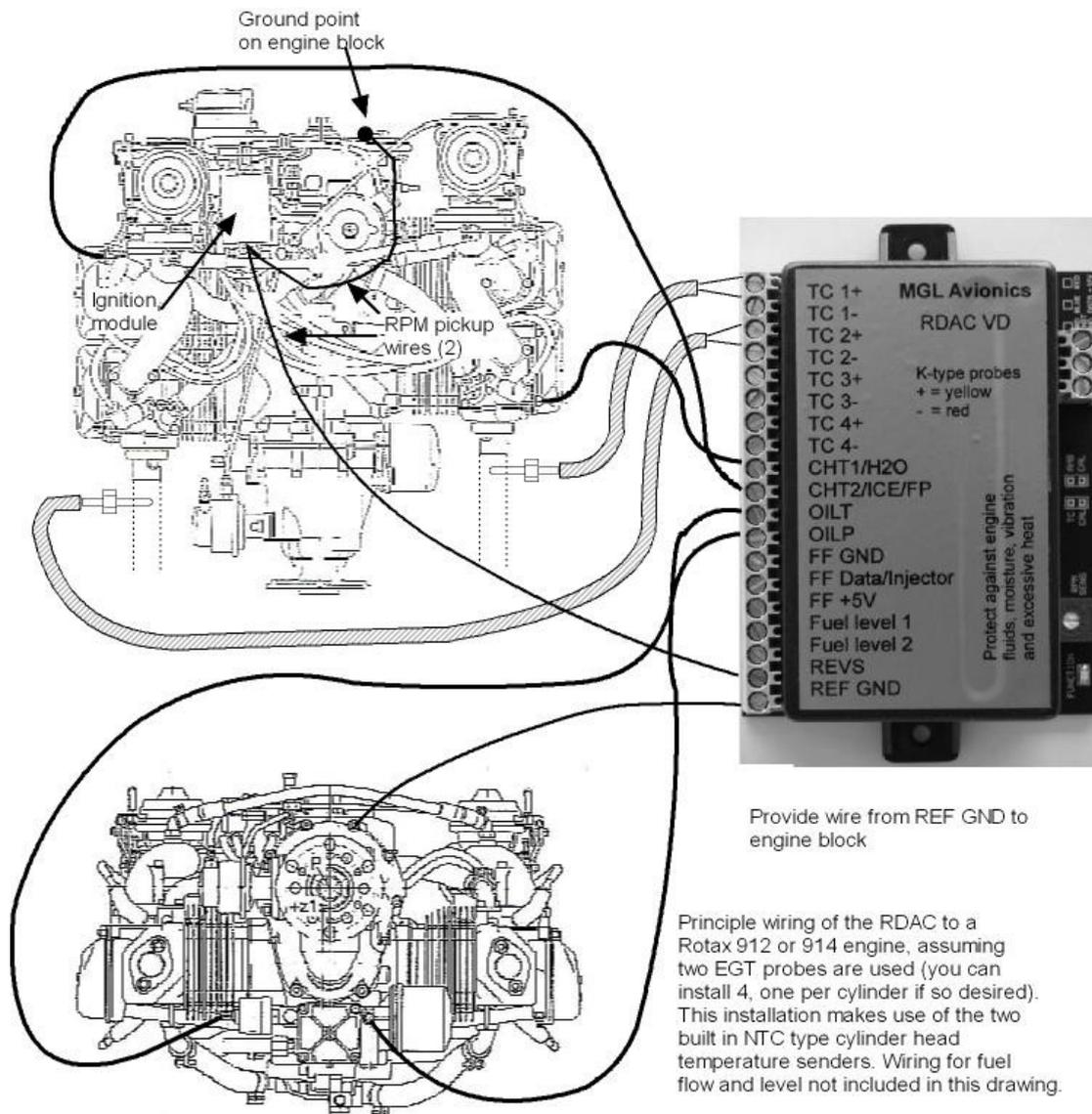
Rotax 503,582,618 DCDI - value 60 (6.0).

Rotax 912,914 – value 10 (1.0).

The rev counter input can be connected to a variety of different sources such as the low voltage side of a ignition coil (at the points contact breaker) or to rev counter outputs of fuel injection computers.

Note: Some Rotax engines may require that a 220 ohm ballast resistor is fitted between the rev counter input and the REF GND terminal. This resistor should be fitted if you cannot obtain stable RPM throughout the range regardless of any setting of the rev counter sensitivity adjustment.

## Connecting a Rotax 912



The Rotax 912/914 contains two built in NTC type CHT temperature senders. In addition oil temperature and oil pressure sender is provided as standard. Due to the fact that the 912 has two carburetors (one for each side of the engine), two EGT probes should be connected, one for each exhaust stack. You can connect four EGT probes if you like. You would use TC1 and 3 as one pair and TC2 and 4 as the other pair. Each pair monitors one side of the engine.

CHT1 and CHT2 connect to the standard CHT senders, again one for each side. Connect oil pressure and oil temperature and you are done.

In the Stratomaster Ultra and similar instruments, use “Engine quick select” to choose the 912 setup and then use “Engine detail setup” to change any settings to your liking.

Connect the Rev counter wires (blue/yellow and white/yellow) as follows: One of the two wires needs to be connected to ground (engine block), the other to the REV counter input.

Do not forget to set the “rev counter setup” in the “Basic setup menu” or “Calibration Menu” (depending on instrument type). Select a value of 1.0 as the engine generates one pulse for every revolution.

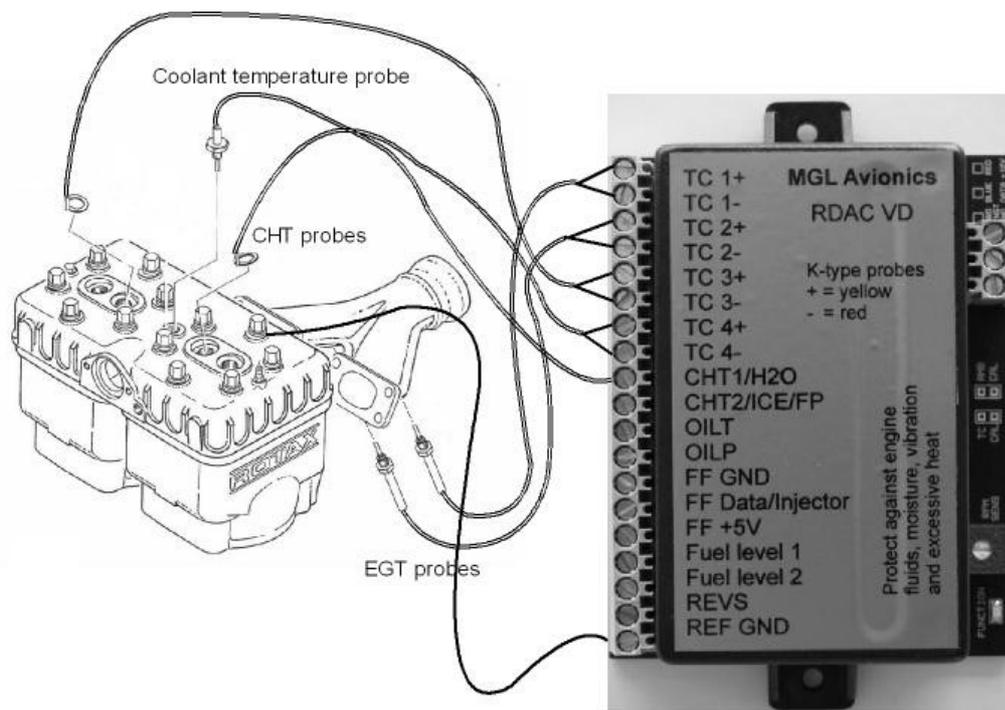
Please note: Most of the senders are “grounded configurations” This means they connect electrically to the engine block. It is vital for good and stable readings that you connect the “Ground” terminal of the RDAC to the engine block using a short, good quality electrical connection.

Never use sealant or PTFE tape on the threads of the senders. This may electrically isolate the senders which will result in incorrect indications.

The threads on these senders are expanding threads which are designed to create a tight metal to metal seal.

## Connecting a Rotax 503 or 582

This diagram shows EGT, CHT and water temperature sender locations and wiring based on a Rotax 582. This is a water cooled engine so CHT senders should be viewed as optional. For a Rotax 503 or similar aircooled installation, proceed similar but omit the water temperature sender and wiring.



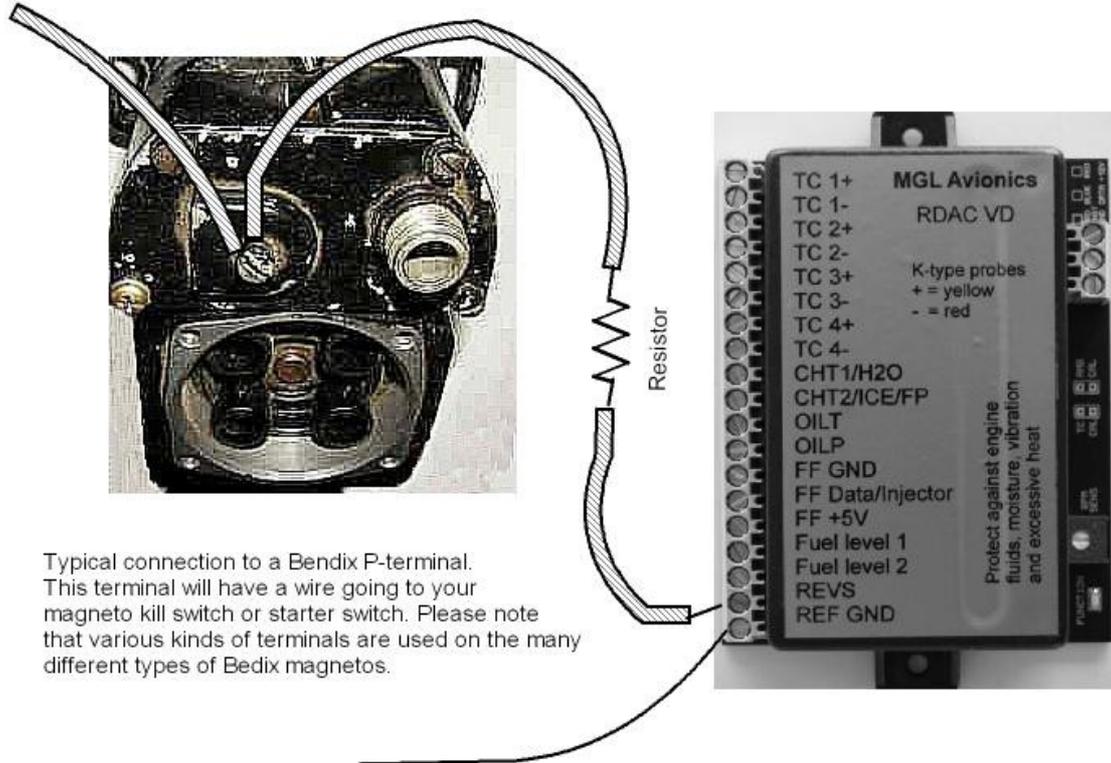
Ground wire connects to a suitable ground point on engine block.  
Note: Engine block needs to be electrically connected to negative terminal of aircraft battery.

Please note that the ground connection (black wire) from the RDAC must be connected to the engine block as shown. Select a suitable point on your engine block for this connection.

The engine block itself needs to be connected to the negative supply, in all cases this should be a direct connection to your batteries minus terminal. This should be a thick copper cable with a very low resistance and it needs to be as short as possible. This requirement is even more severe if you are using electric start as the very considerable currents required by the starter motor will be using this connection.

## Connecting a Bendix magneto as RPM source

To magneto kill switch



Typical connection to a Bendix P-terminal. This terminal will have a wire going to your magneto kill switch or starter switch. Please note that various kinds of terminals are used on the many different types of Bendix magnetos.

Ground wire must be connected to your engine block. Engine block must be connected to battery minus.

The above drawing shows the connection required if you would like to connect a magneto as RPM source.

Shown is a typical Bendix magneto as used on Lycoming and other aircraft engines. You should find a wire connected to a terminal on the magneto that originates from your magneto kill switch (or starter switch). The terminal is often referred to as a "P-terminal". Connect a wire as shown and connect this to the Rec counter input of the RDAC.

We strongly recommend that a resistor is inserted into your wire as shown. A good value would be 10.000 ohms (10K). A normal 1/4 W resistor is just fine.

The above circuit can also be used on other magneto systems such as found on Jabiru and similar engines.