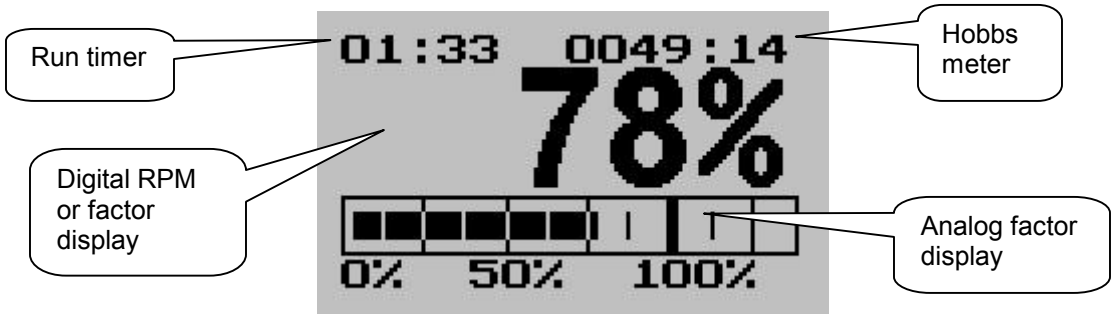
Stratomaster Smart Single

RV-2

Universal Turbine RPM / RPM factor display

The RV-2 unit is a 2.25” instrument providing a universal turbine RPM display that can be adapted to a variety of roles. Typical uses are turbine RPM displays for N1 or N2.
Can use standard tach genies but is also able to be used with almost any electrical signal related to turbine RPM.
The unit can display RPM up to 99.999 or a factor in percent relative to a value that can be entered into the unit. For example 50.000 RPM = 100%. Further to this the following functions are available:
Turbine hobbs hour meter (can be set to current turbine time)
Turbine running timer (can be used as flight timer), resettable to zero at any time.

The main display



About RPM measurements

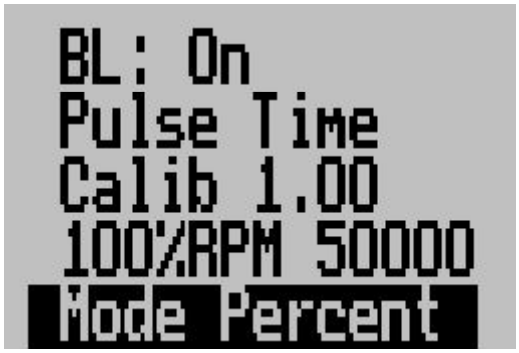
Generally, there are two different methods of measuring RPM. The RV-2 unit can be setup to perform either method.
The first method involves counting pulses generated by some device in the turbine. Pulses are counted over a period of time and the result is then used to calculate RPM. This method requires a high number of pulses due to the short measurement interval of ½ second. This method is suitable for many smaller turbines that do not provide a standard tach generator output but have other types of pickup senders such as geartooth senders.
Engines producing few pulses require a different method. Here the RV-2 can use the time it takes to generate only two pulses as bases for the RPM calculation. This is the method usually used for standard 70 Hz tach generators.

The particular method to be used and the number of pulses per revolution are entered as part of the RV-2 setup as given below.

Setting up the RV-2

Press the Menu key to enter the menu. You can move forward and backwards in the menu by using the + and – keys. To change or select a menu item, move the highlight to the desired item and then press the Menu key. To end an edit or function, press the Menu key again.

To exit the menu and continue normal operation, select the ***Done*** function and press the Menu key. Note, all changes you have initiated during your session will only be remembered by the instrument if you exit the menu using the ***Done*** function.



Zero FT

This function allows you to set the flight timer to zero. The flight timer counts hours and minutes while the engine is running.

Set Hobbs

This function allows you to set the hobbs meter to your current engine running time.

Use the plus and minus buttons to change the indicated part of the hobbs reading. Use the Menu button to change from hour hundreds to hours to minutes.
Moving the update cursor below the numbers past the minutes field on the right ends the edit of the hobbs meter reading and stores any changes.

Contrast …

This function allows you to change the display contrast to your liking. You can select values from about 6 to 25.

BL …

This function allows you to switch the display backlight on or off.

Pulse …

Select if you want the RV-2 to count pulses from the engine for ½ second period (Pulse) or if you want the RV-2 to use the time between pulses to calculate revs (Time).
As a general rule, for maximum display resolution choose as follows:
Signal with many pulses per ½ second – choose “Pulse”.
Signal with few pulses – choose “Time”.

Calib …

Enter the number of pulses per revolution. You can enter fractional values as well.

Example: You have a turbine that produces 8 pulses per revolution – set to 8.00
Example: You have a turbine that produces 1 pulse every 10 revolutions – set to 0.10

100%RPM…

Select the RPM that corresponds to a 100% power setting on your turbine. Note: you can adjust this value slightly if you need to in order to coincide the 100 percent setting exactly and are running out of calibration resolution above.

Mode…

Select if you want your digital readout to show actual RPM or the factor relative to the 100% mark set above.
Use the display set to display actual RPM initially until you are satisfied that your calibration is correct before switching to the factor display.

Technical specifications:

Display temperature range (operational): -20 to +80 degrees C
Supply voltage: +8 to +18V. +24/28V with optional pre regulator.
Supply current: 25mA/40mA (backlight off/on)

Rev counter input:
Range: 0-9999 RPM.
Minimum signal for stable display: 4Vpp.
Fully A/C coupled, maximum voltage +/- 40V.
RF noise filter plus Schmidt trigger based input.

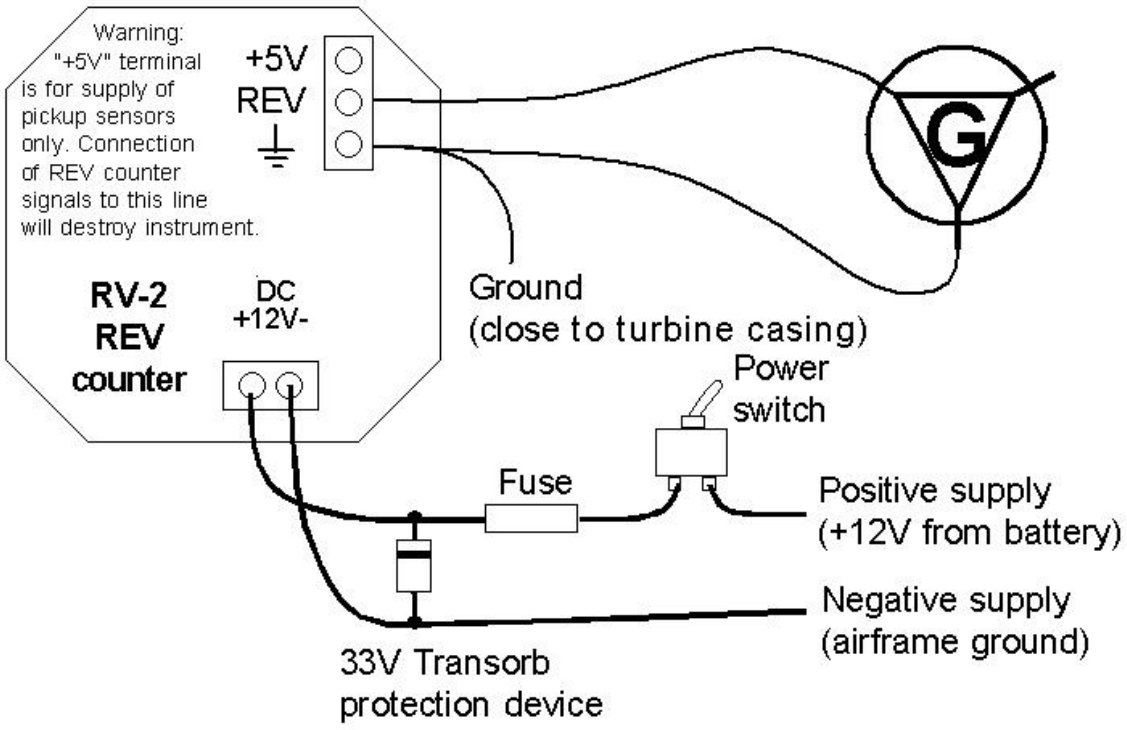
Note: It is essential that a single wire be connected from the minus terminal of the instrument to the turbine block. This wire must not be used to share currents with other electrical users as this can affect accuracy of readings.

Warranty:
MGL avionics warrants their products for a period of one year from date of purchase against faulty workmanship. Warranty is limited to the replacement of faulty components and includes the cost of labor. Shipping costs are for the account of the purchaser.

Note for operation on supplies with inductive loads:

Any operation of electronic instrumentation on power supplies that are subject to high voltages caused by operation of inductive loads (starter motors, solenoids, relays) are required to be fitted with suitable protection.
All Smart Singles are guaranteed to withstand temporary over voltage up to 40V without additional protection. We recommend that measures are taken to prevent voltage transients in excess of this limit.
MGL Avionics recommends the fitment of a fuse in line with a 33V transorb (available from MGL Avionics at low cost) to protect electronic instruments, radios and intercom systems. Only one such arrangement is required for a cluster of instruments.
Please note that product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies.

Installing the RV-2

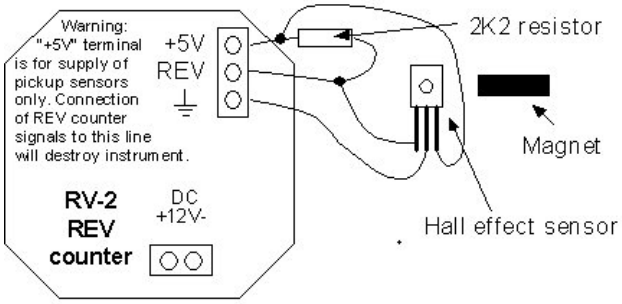


Installation of the RV-2 is quite straight forward in most cases. The above drawing shows a typical connection for a standard 3 phase tach generator. Note that only a single phase needs to be used.

The RV-2 needs a typical voltage swing of about 4V minimum to operate and the input is A/C coupled for easy installation. This means that the voltage signal may have a DC voltage superimposed without affecting the instrument. For example, if you have a signal that varies in voltage from 5V to 8V with every pulse, it can be used with the RV-2.
Should your source generate a signal voltage below the minimum required, you will need to install a suitable amplifier or replace the pickup sensor with a type that has a larger output voltage.

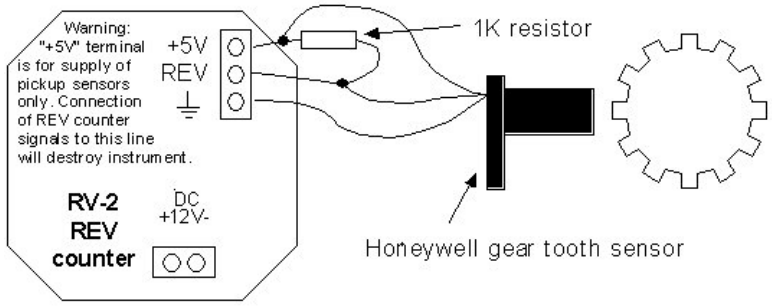
Please note: The 5V supply line is unprotected and intended only for the supply of hall-effect, optical or geartooth sensors. Connecting any voltages (such as the 12V supply) to this line will destroy the instrument.
The 5V line may supply currents of up to 30mA. Should your sensor require greater currents you must supply it from another source.

Various pickup / sensor installation possibilities



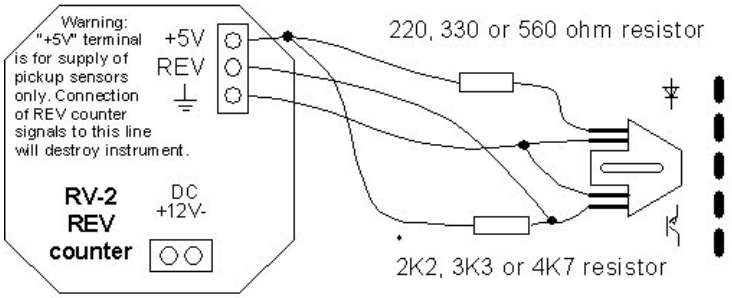
Magnetic pickup with Hall effect sensor

Typical hall effect sensor installation detects the passing of a magnet suitably fixed to flanges or shafts.



Magnetic pickup with active gear tooth sensor

The gear tooth sensor is a popular pickup.



Optical, reflective sensor

The optical reflective pickup can provide a simple means of contactless RPM sensing in difficult installations.