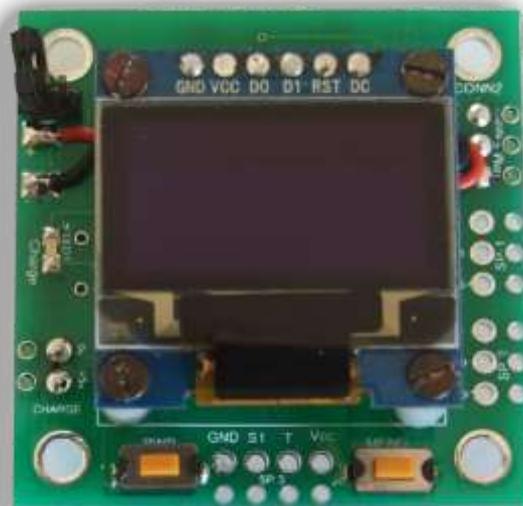




M-SPEED

Minimag Micro Speedo



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Minimag Co. Brighstone, I.o.W.

About

The Minimag M-SPEED is a complete self-contained microprocessor-controlled speedometer featuring a high resolution graphical display. The device is supplied uncased for the engineer to fit into a panel or other enclosure to suit the application.

Included is a pre-wired low voltage omni-field magnetic sensor kit, a plug-in charger and a dimension drawing.

The device is supplied with the battery part-charged and with the battery isolator open. Before first use, move the isolator jumper so that it shorts the two pins together then charge the battery.

Applications

The device can be fitted to steam locos, traction engines, electric locos and other model electric vehicles. The included omni- magnetic sensor has exceptionally long range making it highly tolerant of misalignment and varying clearance due to end-float, suspension travel etc.

How it works

Wheel RPM information is picked up by a magnetic switch arranged to “see” a small magnet fitted to a rotating part of the vehicle, typically an axle or a wheel hub. Thus the device receives one pulse per revolution.

Software is used to calculate speed from a known wheel diameter which can be adjusted between 2” and 15”. Speed is output as both a bargraph and numerics to the high contrast OLED display. An internal Lithium Polymer battery powers the system with a run-time per charge in excess of eight hours. There is a built-in Odometer and hourmeter function. All the time speed is non-zero, running time and total distance are accumulated.

Controls

Two push buttons are mounted below the readout. In a typical panel installation the user would make up button pushrods.

Power button

Press this button once to power on the speedo. The software starts running and displays a welcome screen, preset wheel diameter and program version number for a couple of seconds. Then the display shows SPEED.

To view the hourmeter, press and release the button. Display will revert to SPEED after 6 seconds.

To power off, press and hold for 6 seconds. **Shutdown.....** Is displayed then M-SPEED powers down. There is virtually zero power consumption when it is shut down.

Menu button

For greatest flexibility there are a few settings which can be altered.

Setup. Press and hold MENU for two seconds then release. Display shows:

Setup
Wheel Diameter

Maximum Speed
Mileage
--- Return ---

Press and release MENU to cause a highlighted bar to cycle through the options. Press and hold for two seconds to select the desired option.

Wheel Diameter

This item shows:

Wheel
2.2"
Up/Dn <->/Save

Use the MENU button to select the digit to change.

Use the Power button to cycle round all the available digits.

Press and hold MENU for two seconds to save the setting. Display confirms:

Diameter :
4.0"

Maximum Speed

Use this menu item to scale the bargraph to suit the maximum speed of your vehicle.

Speed
20 mph
Up/Dn (Hold) Save

Use the Power button to cycle round all the available settings (20 to 70 mph). When done, press and hold Menu for two seconds to save the setting. Display confirms

Max Speed
: 20 mph

Display reverts to MPH after a couple of seconds.

Mileage

This accesses the Odometer. Press and hold Menu for two seconds. Display shows total miles for three seconds then reverts to the MPH screen.

To exit the Setup menu, select --Return-- and then hold Menu down for two seconds. You will return to the normal MPH screen.

Hour meter reset

When in the normal MPH screen, press and hold MENU for 30 seconds until the **Reset?** Screen appears. Keep held for a further 6 seconds to zero the hour meter. M-SPEED will then power down. Release within the 6 seconds to abandon the reset operation. If the hour meter is reset you cannot retrieve its previous contents.

Battery charging

An ordinary mobile phone charger having a micro USB plug is used to charge the internal battery. Charging takes about 1 ½ hours. A green LED indicates charging in progress and when it goes out, charge is complete. The device may be operated whilst charging. Running time per charge is in excess of eight hours.

Charging from a DC supply

There is a 2 way screw terminal block for an external 5 volt supply. The device may be both charged and powered using this connector. The battery isolator should be kept in the shorted position when running from an external supply

Please note: Do not exceed 5 volts. Observe correct polarity.

If it is desired to run the device from the vehicle's traction battery a suitable regulator and filter will be needed. Please consult Minimag Co. for further information.

Installation

1. Choose a location for the sensor. In the case of a loco, consider sensing a non-driving wheel, to avoid the effects of slip. Eg. A pony or tender wheel. The maximum operating temperature of the sensor is 85 degrees C, therefore avoid close proximity to ashpan, injector exhaust, drain cock etc.
 2. The sensor kit includes a piece of adhesive lined heatshrink sleeving. After fitting the PVC wire sleeve, the heatshrink may be used to encapsulate and seal the sensor head so as to environmentally protect it. That done, it can be inserted into a 5mm hole for end-sensing the magnet. Optimum gap is 5 to 10mm. If mounted too close, double pulsing can occur and you'll get an erratic readout. Sensor leads may be extended as required.
 3. Fix the magnet. The magnet can be recessed into the back of a cast wheel flange, into a wheel hub or fitted into a collar or disc attached to an axle. The parent metal can be ferrous or non-ferrous.
 4. Locate a good spot for the readout away from high temperatures. You'll need to construct a suitable case to protect it. The case can be of metal, plastic or even a 3D print.
 5. It might be advantageous to run a USB extension or wiring from the charging terminals to an external charging connector. We can help with cabling.
- Program in wheel rolling diameter and maximum speed as per instructions above.