SpeedPulser Installation Guide

Forbes Automotive

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Product Overview

Thank you for purchasing the SpeedPulser for Volkswagens by Forbes Automotive!

The product is designed to take digital pulses from a speed sensor within the gearbox and translate this into a PWM signal which drives an OEM speedometer. It's perfect for situations where a physical speedometer cable cannot be installed or those wishing for a clearer installation. It is budget-friendly and therefore requires some final user setup and calibration.

The SpeedPulser also accepts speed signals from Can2Cluster – which can get speed from the ECU, DSG or GPS inputs.

The device takes the signals and converts them into signals to suit analog clusters – like the MK1 & MK2. It is fully opensource and the source code can be downloaded and adjusted to suit other brands if required. Please get in touch if you need help!

Inputs:

- 12v ignition
- Ground
- 12v square wave pulse from gearbox hall sensor or Can2Cluster

Outputs:

- PWM to drive the motor

Software Benefits:

- Fully calibrated motor: Duty Percentage vs. Resulting Speed
- Needle Sweep

Wiring Installation

Wiring the new module in is easy! You'll need access to:

- Gearbox hall sensor or Can2Cluster
- 12v Ignition
- Ground

Use the outputs as per the diagram below to suit your installation. Final firmware update may be required to suit final requirements!

Initial Setup

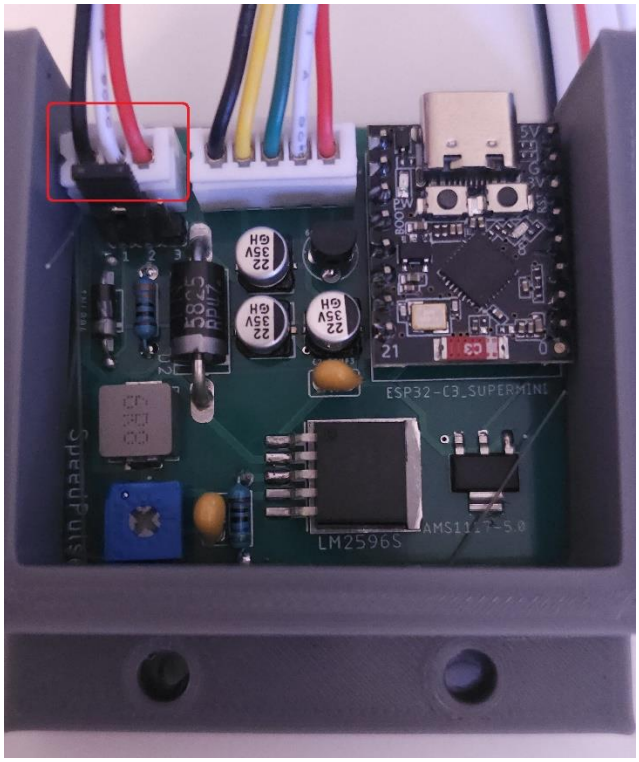
There should be an appreciation that every cluster is slightly different and that the manufacturing tolerances of each SpeedPulser will be slightly different. It is therefore assumed that the end user will complete the final installation of the coupler and ‘speed limit’.

Overview of Connections

Three Pin:

The three-pin connection are the three main connections to the car. The colours below may vary, but looking left to right in the below picture (from the edge of the PCB), the connections are:

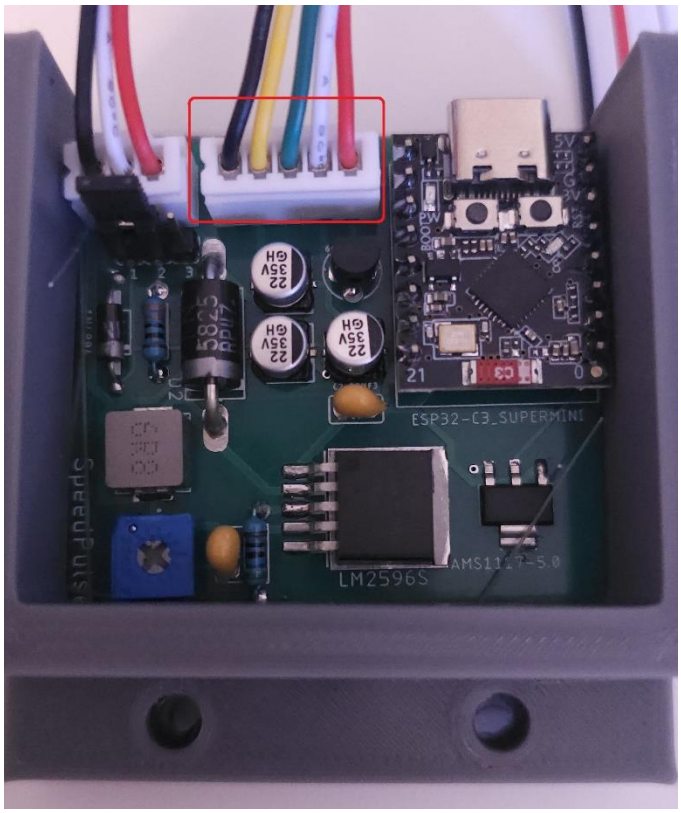
- 12v Ignition (black)
- Ground (white)
- Speed Pulse (hall sensor etc) (red)



Five Pin:

The five-pin connection leads to the motor and comes pre-extended. There may be instances where these are not long enough and they can be extended. Similarly, looking left to right as the picture above:

- Motor Power (black)
- N/A (yellow)
- Motor Direction (green)
- Motor Ground (white)
- Motor PWM (red)



Hall Sensor

The OEM Hall sensor should also be powered. Typically, on Volkswagens, the pinout is:

Pin 1: Power (12v)

Pin 2: Pulse (this goes to the SpeedPulser)

Pin 3: Ground

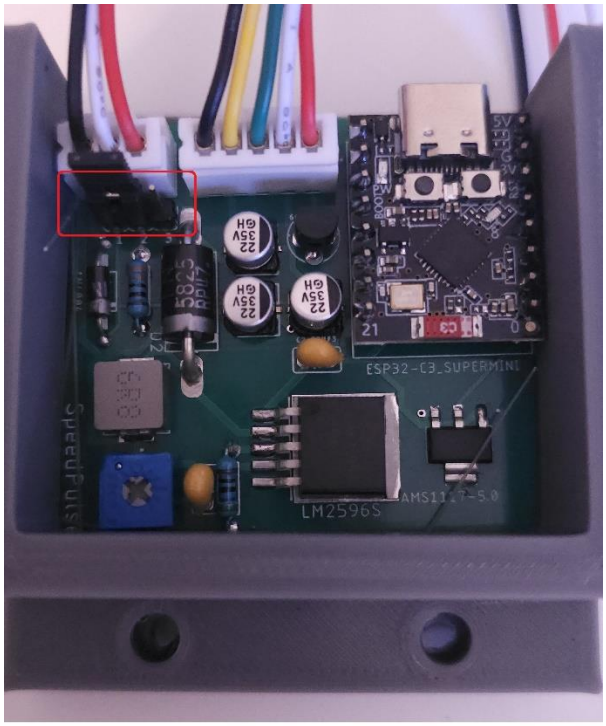
Pull-Up or Pull-Down?

Some sensors will require a pull-up or pull-down resistor. The default for Volkswagens tested to date are ‘pull-up’ and this is the default position for the selection on the board. It can be varied using the jumpers on the board.

Pull-up: Pin 1 & 2

Pull-down: Pin 2 & 3

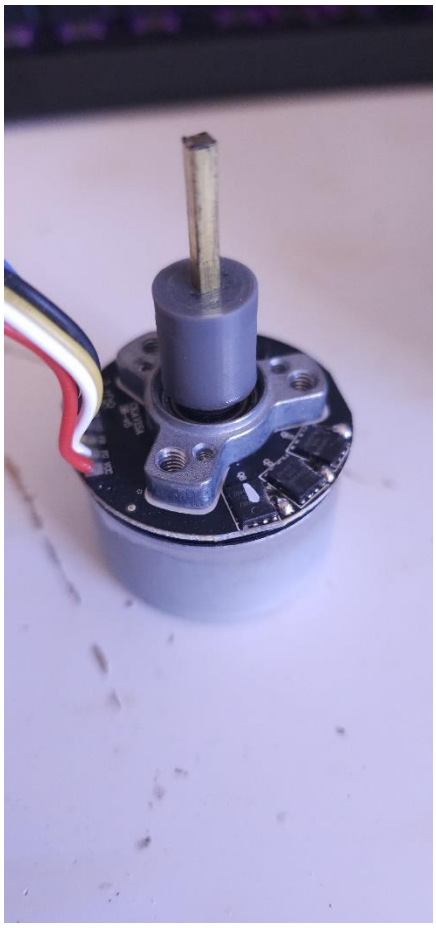
None: removed



Coupler Installation

The motors will come with the coupler pre-installed and the final drive pin and securing pins separate. The end user should remove the motor and align the drive pin into the coupler and push it home. It will be a tight fit, but a few light taps will drive it home. A spare coupler is also supplied in the kit.

There should be an appreciation that the couplers are 3D printed and therefore may have some alignment variations, this is the chance to lightly heat (~100c max) to encourage/make run true. If the coupling has excessive vibration is may strip out, but a drop of superglue will repair this and run indefinitely. If this is required, ensure that the coupler runs true! Future revisions may look to replace these with a metal alternative, but this would reflect in a higher price. The point of this kit is to remain budget friendly.



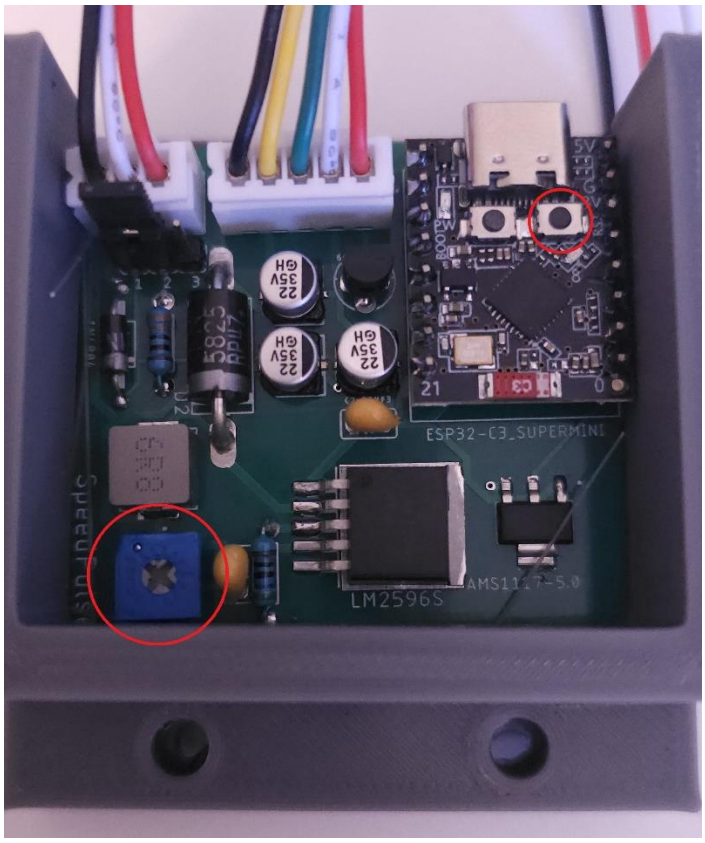
Installation onto the Cluster

Once the motor is built up, it can be slid over the OEM cluster. Fitment of the drive pin should be confirmed and that the motor spins freely. Some fine tuning here will keep noise to a minimum and reduce the risk of premature failure of the coupler.

The drive-pin length should also be confirmed and ensure that it does engage with the cluster but does not bottom out and stop the housing seating fully. Take your time here!

Speed Calibration

Once the motor is installed and powered up, the main red LED will illuminate. Using the right hand button and the unit powered up; press and hold. This button will drive the motor at full speed and allow the user to check for alignment and noise issues.



Use the blue potentiometer (bottom left) to adjust the voltage of the motor to suit the maximum speed of the cluster. Once this has been achieved, the cluster can be re-installed into the car.

First Run & Latest Firmware

There is a blue LED which will flash to give a visual indication that the SpeedPulser is receiving a signal. It will translate this pulse into an appropriate PWM duty cycle which will drive the motor.

There may be a requirement to fine tune individual setups. As the code is all opensource, this can be carried out easily and can be walked through.

Disclaimer

DISCLAIMER:

Forbes Automotive is not responsible for any damage or loss that may occur to your vehicle or its contents during or after the installation of the SpeedPulser Module. By agreeing to use our product, you acknowledge that you have read and understand this disclaimer and agree to release Forbes Automotive from any liability for damages or losses.

Final calibration is indicative of speed of the gearbox and NOT of the car. Some tuning may be required by the end user if they feel the speed indicated is not accurate. We cannot be held responsible for incorrect speed readings or similar.

LIMITATION OF LIABILITY:

In no event shall **Forbes Automotive** be liable for any direct, indirect, incidental, consequential, special, or punitive damages arising out of or in connection with the installation of the SpeedPulser module, whether in contract, tort, strict liability, or any other legal theory.

This product is to be used in off-road applications only.

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