SpeedoDRD   Installation & Setup Guide (for versions 3.2M to 3.7M)

Installation
- Make sure the vehicle is OFF
- Locate the speed sensor (rear of engine / transmission, front sprocket cover, rear or front wheel)
- Remove anything necessary to get to the speed sensor connector (seat, prop up tank, etc)
- To ensure you have selected the correct connector, roll the vehicle with the keyswitch on, and watch for a speedometer reading, then unplug the connector, and roll the vehicle again, you should not see any speedometer reading.
- Unplug speed sensor connector; connect the SpeedoDRD unit in between the connectors.
  note: some sensor plugs use the same connectors as the speed sensor, but are not the speed sensor plug.
- If you have other devices connected to your speed sensor, connect the SpeedoDRD last (near the ECU).
  Example: (Speed Sensor -> Other Devices -> SpeedoDRD -> ECU/Gauge Cluster)
- See "SpeedoDRD Test Mode" to make sure you installed the unit to the correct sensor plug.
- Read "Product Care & Precautions" to ensure you select a good mounting location for SpeedoDRD.
- Make sure to mount the SpeedoDRD far away from spark plug wires and coils (at least 6 inches away)
- Once the SpeedoDRD is installed & tested, you're ready to program it, see "Quick Setup Guide".

Quick Setup Guide
Watch the example video here... **www.12oclocklabs.com/sdrd_video.htm**
Then use our online setup tool here... **www.12oclocklabs.com/sdrd_calc.htm**
If you do not have internet access, see section "SpeedoDRD Programming" for further instructions.
For example programming, see "Example Programming" section, but we still recommend watching the example video.

SpeedoDRD Test mode
Turn ON the vehicle (don't start it), the SpeedoDRD will quickly flash RED then GREEN. If it did not flash RED then GREEN, you have the SpeedoDRD plugged into the wrong sensor plug. Generate Test Frequency 100Hz (See "SpeedoDRD Main Menu" below), and check your speedometer gauge for a reading, if no speedometer reading appears, try 400Hz, then 1000Hz. One of the 3 frequencies will generate some kind of speed reading on your speedometer. If none of the frequencies generate a speed reading, you have the SpeedoDRD plugged into the wrong sensor plug.

SpeedoDRD Main Menu
Once your SpeedoDRD unit is installed, and your vehicle's power is turned ON, you can HOLD the gray button on the SpeedoDRD for a specific number of blinks to access any of these menu items, for example, holding the button for 1 Red Blink, then releasing will display your max speed. If you missed a selection, just keep holding the button and wait, after 10 blinks, there will be a 1 second pause, and the blinking will start over.

1) Display Max Speed for 5 seconds (on your Speedometer Gauge)
2) Display Correction Percentage (Red = negative number / Green = positive number / Long Blink = 0)
3) Display Multiplier & Divider (Red blinks = Divider Enabled / Green blinks = Multiplier Enabled / Long Blink = 0)
4) Display KPH Conversion Value (GREEN=MPH to KPH / RED=KPH to MPH / ORANGE=No Conversion)
5) Enter SETUP for Correction Percentage (see "How to Enter a Number Value" for next programming instructions)
6) Enter SETUP for Multiplier & Divider (see "How to Enter a Number Value" for next programming instructions)
7) Enter SETUP for KPH Conversion (see "How to Enter KPH Conversions" for next programming instructions)
8) Generate Test Frequency 100Hz (generates test frequency for 5 seconds)
9) Generate Test Frequency 400Hz (generates test frequency for 5 seconds)
10) Generate Test Frequency 1000Hz (generates test frequency for 5 seconds)

SpeedoDRD Programming
Perform a Factory Reset to make sure you are starting fresh (Read the "How to Clear..." section). Read "How to Obtain your Correction Percentage" to calculate your correction percentage. See "SpeedoDRD Main Menu" and select option 5; "SETUP for Correction Percentage". If you're doing a gauge swap, or special application, see "Special Application Programming".

How to Enter a Number Value
You are now seeing a quick red and green flashing pattern, this pattern is called the Alt Pattern, it signifies the unit is ready for you to input some data.

1) HOLD the button down, the LED will change from GREEN [positive], to RED [negative]. Release the button at RED for a negative number, or release the button at GREEN for a positive number. In the case of Multiplier & Divider setup, Green = Frequency Multiplier, and RED = Frequency Divider.

2) You will now see the Alt Pattern again, you are now going to enter the first digit of your 3 digit number, this is the 10's column [X]X.X , HOLD the button and count the blinks, 10 blinks represents a zero. Release the button after counting the blinks you need to make the first number.

3) Repeat the same method again for the next two numbers, remember the last number is your decimal point number, if you don't have a decimal point in your correction percentage value, the last number should be zero. If you only have a 2 digit number, the first number will be zero.

4) After entering the last digit, you will see 1 Orange Blink confirming the setup was saved to memory.

Tip) During an Alt Pattern, when the unit is waiting for data input, you can skip entering a value by holding down the button until the Alt Pattern stops, then quickly release the button, this skips inputting any data and causes a default value to be entered. The default value for KPH setup is "No Conversions", Positive/Negative is "Negative", and for numerical values is "Zero". Utilizing this feature provides a quicker way to skip a data input section; and select its most commonly used value.

How to Obtain your Correction Percentage
We recommend to use the easy web-based tool at www.12oclockLabs.com , or you can use one of the formulas below.

Using your modified gearing the formula is:
Correction Percentage =
((your front sprocket / your rear sprocket) / (factory front sprocket / factory rear sprocket) * 100) – 100

Using the Speed of a GPS device the formula is:
Correction Percentage = ((GPS Speed / Speedometer Readout) * 100) – 100

Using the Distance from a GPS device the formula is:
Correction Percentage = ((GPS Distance / Odometer Distance) * 100) – 100

Example:
Lets say your GPS reads 55mph but your Speedometer on your bike reads 60mph,
you would do the following math:
((55 / 60) * 100) – 100 = -8.3 (round to one decimal place) [Your correction percentage would be -8.3%]

How to Enter KPH Conversions
You are now seeing a quick red and green flashing pattern, this pattern is called the Alt Pattern, it signifies the unit is ready for you to input some data. HOLD the button down, the LED will change from GREEN [MPH to KPH], to RED [KPH to MPH], to ORANGE [No Conversion]. Release the button at the color which represents the conversion mode you would like to select. ORANGE [No Conversion] is the most common selection for all users, and the default, it is very rare you would ever want to select anything else.

Special Application Programming
Sometimes a correction percentage of + or – 99.9% is not enough, in which case SpeedoDRD has a frequency multiplier and divider onboard, any number from 0 to 99.9 can be entered into the multiplier or divider, The SpeedoDRD has an internal frequency limit of 50,000Hz, which is well beyond the spec range of virtually any speed sensor. Say for example your vehicles transmission gives out a pulse per mile of 8,000 (8000ppm) but you want to fit a replacement gauge cluster from another vehicle which has a pulse per mile rate of 16,000 (which is twice as high). You could setup your SpeedoDRD to use a multiplier of 2.0 (SpeedoDRD main menu, option 6), then take the vehicle for a drive with your GPS, and use the Correction Percentage feature (SpeedoDRD main menu, option 5) to Fine Tune the Speedometer to the exact speed reading needed. For gauge cluster swaps it is recommended to connect the SpeedoDRD between the gauge cluster and ECU (vehicle computer).

How to Clear... Your Max Speed, Programming, or Both (Factory Reset)
Make sure the vehicle is OFF, HOLD the button, turn the vehicle keyswitch ON (don't start it) while still holding the button, the LED will change from GREEN [Clear Programming], to RED [Clear Max Speed], to ORANGE [Clear Everything (Factory Reset)], Release the button at the color which represents the action you would like to perform, after making a selection, the LED will give an ORANGE flash to let you know the data was cleared.

Note About Max Speed
The Max Speed Saving feature automatically activates after your vehicle has been continuously moving for about 25 seconds, and only saves the max speed when your vehicle stops and the speedometer reads 0mph. This is a safeguard to prevent excessive EEPROM write cycles. Because of this internal safeguard, after riding continuously for at least 25 seconds, you should wait until your speedometer drops to zero before turning off your vehicle (if you wish to save the max speed).

Example Programming
These example steps will enter a correction percentage of -7.7%
Make sure vehicle ignition switch is ON, and vehicle is NOT running.
Hold the button for 5 RED blinks then release (you will then be in Percentage Adjustment mode)
Hold the button until the LED turns RED then release (this selects a negative number)
Hold the button for 10 RED blinks then release (this enter's a 0 digit)
Hold the button for 7 RED blinks then release (this enter's a 7 digit)
Hold the button for 7 RED blinks then release (this enter's a .7 digit)

Product Care & Precautions:
Mount SpeedoDRD away from extreme Heat. Close engine and exhaust contact should be avoided. Mount SpeedoDRD in a relatively dry area, though the unit is weather proofed, it is a good idea to avoid frequently wet areas. Make sure to mount the SpeedoDRD in a location where it will not be crushed. Make sure to mount SpeedoDRD away from spark plug coil and wires, minimum distance is at least six inches. For troubleshooting help see www.12oclockLabs.com FAQ section.

Disclaimer:
By using this product you agree to assume all risk and liability therein, and not hold responsible 12oclockLabs for any mishap (either foreseeable or unforeseeable) that may arise from using or misusing this product; this includes all items sold or distributed by 12oClockLabs. All electronic devices are subject to possible failure during normal usage, and by using this product you agree to assume the risk and liability for such a possible failure.

3 Year Limited Warranty:
In the event of product failure due to normal usage, 12oclockLabs may elect to repair or replace your product, for a period of 3 years from product purchase date; at their option. This warranty does not cover damage from misuse, neglect, alteration, or self repair. 12oclockLabs will determine if any damage incurred was not due to normal product usage. This limited warranty applies to the original purchaser of the product, and is transferable to a new owner with proof of purchase.