

# SPEEDOHEALER v4



Electronic Speedo and Odometer Calibrator with Top Speed Memory

## User's Guide

### 1. Foreword

Congratulations on your purchase of a SpeedoHealer calibrator unit. At HealTech Electronics Ltd. we are committed to produce the best calibrator devices available and we would like to thank you for choosing our product.

The Harness Kits required for installation are packed separately. Along with the SH unit, please make sure to order the correct wiring harness kit for your bike.

After installation, it is best to use our online calculator to calculate the required calibration value and to generate step-by-step programming instructions. You can also download the calculator for offline use.

### 2. Features Explained

**New User Interface:** Easier to program, review and update the stored parameters.

**3 functions in 1 unit:** Programmable Calibrator, Converter and Top Speed Memory.

**Extended calibration range:** -99.9% to +9999.9% in steps of 0.1%

This means the signal can be adjusted from 1/1000 to x100, in increments of 0.001. This range is efficient even for the most radical sprocket conversions and suitable for all kinds of custom applications as well (e.g. different engine-gauge combination, bike engine powered cars, etc).

**Detachable Remote button** for the Top Speed Recall feature.

**Dual-Bank Memory:** Allows storing two independent calibration values and switching among them is possible by the press of a button. There is a clear, visual confirmation of the active bank and value in use.

Useful for road & track setting when changing gearing or wheel size, also easy to bypass the speed limiter when on the track (*e.g. when riding a ZX14 on the street, select -7% to have an accurate speedo, and switch to -90% if you wish to attempt a 200+ mph run on the track*).

**Km/h conversion:** Change from Km/h to MPH by the press of a button.

**Interactive test mode:** Confirm installation before leaving the garage.

**Compact dimensions:** Full SMD design. The smallest and lightest calibrator ever built.

**High-speed CPU:** 32-bit processing ensures high accuracy and immediate response to the input signal (no lag). Ultra low power consumption and auto stand-by.

**Robust design:** 100% weather proof. Every unit is fully tested, guaranteed to work. All leads are protected against reverse voltage, short circuits and high energy transients. Wide operating range: +3V to +19V at -40C to +80C (-40F to +176F)

## 3. Setting and Using your SH

### 3.1 Preparation

1. Ensure that the unit is installed correctly by executing the SH Test instructions (*Refer to the Install Guide bundled with the Harness Kit*).
2. Determine the Calibration value needed for your application (*If you can't access the on-line calculator, refer to chapter 4*).
3. Turn ignition ON.

### 3.2 Programming a calibration value

- Entering into programming mode does not clear the previous setting, so you can update a previously stored calibration value easily.
- All settings are stored in Flash memory. No need to repeat programming after the battery or the SH box has been disconnected.

1. Press **BOTH buttons** on the unit until [L] is indicated.
2. The Sign of the calibration value is blinking:
  - [-] : Negative
  - [P] : PositiveTo toggle the Sign, press the **SET** button.
  - If the Sign you set is Negative, you will program 3 digits (max value: 99.9)  
If Positive sign was selected, you need to enter 5 digits (max value: 9999.9)
  - You need to enter all digits (including the leading zeros), e.g. enter -07.5 if you want to program -7.5%
3. Press **SEL** to proceed to the first digit of the calibration value.  
[n] (next) is shown, and then the value of the first digit will blink.  
Press **SET** repeatedly until the desired value is shown.  
Repeat this step until all digits are entered.
4. After the last digit has been entered, press **SEL** to exit from programming mode.  
[o] (over) is shown, and then the unit will display the programmed digits in order, just like any time ignition is turned ON.

### 3.3 Reviewing the calibration value in use

Whenever the ignition key is turned ON, the unit will show the following information in order:

- Memory bank in use: either [A] or [b]
- Sign of the Calibration value: [-]: Negative, [P]: Positive
- Calibration value without leading zeros
- Conversion mode active [C] or not (blank)

Examples:

- [A 0] means memory bank A is active with no calibration (factory default)
- [A - 7. 5] means memory bank A is active with -7.5% calibration
- [A - 1 2. 5 C] bank A is in use with -12.5% and Km/h conversion is enabled
- [A P 5. 0] means memory bank A is active with +5.0% calibration
- [b P 6 2 3 4. 5 C] bank B, +6234.5% and Km/h conversion is enabled

### 3.4 Reset

There is no need to clear the memory before programming a new calibration value. You can overwrite the previous setting easily.

However, if you wish to clear all settings and go back to defaults:

Press **BOTH** buttons on the unit and keep it depressed until **[E]** is indicated.

When the unit is powered up with default parameters, **[A 0]** is displayed.

This means memory bank A is active with no calibration. The unit will work in *Transparent mode*, i.e. the speedometer will read the same as with no SH installed.

### 3.5 Switching between A and B calibration value

Press **SET** until the active memory bank (**[A]** or **[b]**) is displayed and keep it depressed for one more second, until the value switches.

→ When you program a calibration value (chapter 3.2), you can program the value in the active memory bank only.

### 3.6 Activating the Km/h to MPH conversion feature

Press **SEL** until the actual mode (**[C]** or **[-]**) is displayed and keep it depressed for one more sec, until the value switches.

When Km/h to MPH conversion is active, the indicated speed and distance travelled will be converted, but the displayed units of measure (km/h and km) won't be changed.

→ It is possible to switch on/off the Km/h to MPH conversion only.

If you wish to use MPH to Km/h conversion, you have to program +60.9% (1.609 multiplier) on top of the calibration value you need. However, keep in mind that your speedometer's maximum reading will not be changed. E.g. a speedo with 186 MPH highest reading will not be able to show over 186 Km/h after conversion.

### 3.7 Top Speed Memory function

Connect the 2-pole plug of the remote button to the unit's TSM socket.

The SH continuously records the highest speed in Flash memory.

- To recall the top speed, press and release the remote button. The top speed is shown on the speedometer for a few seconds, and the SH display will count from **[5 to 0]**.
- To reset the Top Speed Memory, press and hold the remote button for at least 2 seconds. The speedometer will read 0, and the SH display will indicate **[E]** (Erased).

### 3.8 Test mode

In Test mode, you can check whether the SH is installed and working properly.

To initiate test mode:

- Make sure the ignition is OFF (unit is powered down).
- Press **SEL** and keep it depressed while you turn the ignition ON. **[t]** (test) is now indicated. Release the button. *The speedo should indicate a number other than zero.* If you wish, you can change the speed reading in 9 steps by pressing **SET** repeatedly.
- Rotate the rear wheel. **[t]** *should be blinking as the wheel turns.*
- Press **SEL** to exit from Test mode. The unit will work normally.

## 4. Calculations

### 4.1 Precise method

If you have access to a good speed reference, such as a GPS, radar speed sign, dynamometer (dyno) or another vehicle with accurate speedo:

Read your indicated speed when the actual (reference) speed is e.g. 60 mph or 100 km/h.

Repeat the measurement to make sure you get consistent results. Then use the following formula to get the calibration value you need:

$$SH \text{ Calibration value} = \left( \frac{\text{Actual}}{\text{Indicated}} - 1 \right) \times 100 \%$$

Example:

If your indicated speed was 66 mph at 60.0 mph actual (reference), the calibration value would be: -9.09% → -9.1%

### 4.2 Estimated method

Use this method when speed reference is not available and you have changed your gearing.

The following formula takes into account the standard and new sprocket sizes, as well as 5% factory speedo error (typical for most bikes).

$$SH \text{ Calibration value} = \left( \frac{\text{new front} \times \text{std rear}}{\text{std front} \times \text{new rear}} - 1.05 \right) \times 100 \%$$

Example:

You have changed the gearing from 16/44 to 15/45, then:

$$\left( \frac{15 \times 44}{16 \times 45} - 1.05 \right) \times 100 = -13.3 \%$$

## 5. Warranty

The SpeedoHealer is built to last: all leads are protected against reverse voltage, short circuits and high energy transients. Only high quality components have been used, and the epoxy layer construction gives extreme protection for the internal parts from shocks, vibrations and water. To ensure trouble-free operation from the start, all units have been extensively tested prior to shipping.

Should you not be entirely satisfied for any reason, we offer a 30-day money-back guarantee (*all parts must be returned in original condition for full refund*).

Furthermore the product is covered by our 2-year replacement warranty from the date of purchase (*the unit should not be damaged or subjected to over voltage*).

Please contact us directly at [support@healtech-electronics.com](mailto:support@healtech-electronics.com) if there are any issues, regardless of the place of purchase.

[www.speedohealer.com](http://www.speedohealer.com)