

# Operating and installation guide

- motoscope mini -

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#### Contact:

motogadget GmbH Köpenicker Str. 145 10997 Berlin Germany

fon +49-30-27 59 19 20 fax +49-30-27 59 19 22

www.motogadget.com info@motogadget.de

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# 2.1 Duty of registration

The **motoscope mini** does not have to be registered if used in addition to a registered speedometer. If it is used as a single instrument without any other speedometer in areas of public traffic, the use of the instrument must conform to the laws of the country concerned. This can mean a legal check by an official authority and registration in the vehicle papers.

THE USER OF THE INSTRUMENT IS PERSONALLY RESPONSIBLE FOR COMPLYING WITH ALL RELEVANT LAWS IN THE COUNTRIES CONCERNED. THE USER IS PARTICULARLY RESPONSIBLE FOR CORRECT CALCULATIONS AND ADJUSTMENTS ACCORDING TO THE TIRE CIRCUMFERENCE, IMPULSES PER WHEEL ROTATION AND THE INSTALLATION OF THE SPEEDOMETER SENSOR.

#### 3 Technical data and functions

length / width / height weight without cables threaded fastening bores operating voltage current consumption operating temperature 59 mm / 21,5 mm / 13 mm ca. 32 gr.
2 x M3, 5 mm deep
9 -18 V
max. 100 mA
-20 - +80 °C

# 3.1 Summary of functions

| Function                        | Measurement range    |
|---------------------------------|----------------------|
| Speedometer                     | 0 – 999 km/h or mi/h |
| trip odometer                   | 0 –999,99 km or mi   |
| total odometer (adjustable)     | 0 -99999 km or mi    |
| trip time                       | 0 - 99:99 h:m        |
| rev counter (digit read out)    | 0 -20,000 rpm        |
| rev counter as LED bar          | 0 -20,000 rpm        |
| rpm threshold LED (shift light) | 0 -20,000 rpm        |

# 4 Preparation for installing and connecting the instrument

#### 4.1 Required knowledge and abilities

Installing and connecting the *motoscope mini* and its additional equipment requires no special knowledge or abilities if exact attention is paid to the following installation guide. The *motoscope mini* can be installed on a wide range of different vehicles with different specifications and equipment. For this reason it is not possible to cover all special cases within this description. In cases of doubt, please consult the information supplied on our web site under Support and FAQ. If installation of the *motoscope mini* still seems to be too complicated we recommend installation by a professional expert.

#### 4.2 Required materials for installing and connecting the instrument

Since the *motoscope mini* is suitable for a variety of vehicles, **additional materials** might be necessary in order to mount the instrument to an individual vehicle. Such materials can include:

- mounting bracket for the instrument and fitting screws for the bracket
- mounting bracket for the speedometer sensor and the pushbutton
- cables or cable extensions for voltage-supply, ignition-signal and pushbutton connection
- assembly materials such as cable ties, plug connectors, shrink hose, soldering iron, solder etc.

The use of wiring diagrams for the vehicle concerned is also recommended.

The speedometer sensor is already equipped with a 1.5 m long connecting cable, which makes it possible to mount it to the front or rear wheel. Mounting requires a self-made holding bracket sufficient for each individual vehicle.

#### 5 Quick start

This section provides a guide to quick installation and connection of the *motoscope mini* 

- a) Make sure that you have all necessary materials and tools available before starting the installation. Such materials are: an instrument mounting bracket, a pushbutton, fitting screws and nuts, screw adhesive (medium-strength), cables, cable ties, plug connectors, shrink-hoses and soldering tin. Necessary tools are: screwdrivers, wrenches, an Allen key for M3 metric Allen screws, a side cutter, small pliers, soldering iron, a voltage indicator and a crimping tool.
- b) Make sure you have the wiring harness diagram of your vehicle and the terminal location plan of the *motoscope mini* (see appendix)
- c) Choose suitable positions for installing the motoscope mini and the speedometer sensor. Select a point to which the cables will be routed in order to connect the motoscope mini, the speedometer sensor and the pushbutton. Cut and drill the motogadget mounting bracket for best fit or construct your own bracket. Design and make a mounting bracket for the speedometer sensor switch and attach it to the point you have selected.
- d) Mount the instrument and sensor on the vehicle.
- e) Locate "switched plus" on the wiring harness of the vehicle by using a voltage indication device. "Switched plus" means current must not flow until electric power is switched "on".
- f) Remove the ground cable from battery terminal.
- g) Look for the negative terminal of **one** ignition coil (primary circuit!) and route a cable from this point to the terminal point you have chosen in stage c).
  - (Attention! In the case of a genuine CDI ignition the positive terminal of the ignition coil must be used! In such a case, please read the corresponding chapters under "CDI ignition".)
  - Route cables from the voltage supply, the speed sensor, and pushbutton to their chosen location. Then connect the cables according to the circuit diagram provided in the appendix.
- h) Re-connect the vehicle battery and turn the voltage supply "on".
- i) Navigate to the setup menu (see Chapter 12) and adjust all necessary parameters for engine speed, the rev. counter scale and the speedometer.
- j) Start the engine and watch the rev. counter. If it works correctly, ride carefully and slowly for a while and check the speedometer for plausibility. If you do not detect any problems regarding the electrical or mechanical functioning of the instrument and the vehicle itself, continue the test ride.

# **6 General safety instructions**

- For safety reasons the vehicle battery must be disconnected prior to the installation.
- Take particular care that all delivered parts are fastened securely to your vehicle. This is important for your own and other peoples' safety.
- Make sure that your vehicle is equipped with interference suppressing spark plugs and connector cables!

Use of the *motoscope mini* with non-suppressed ignition systems can lead to serious damage to the device!

# 7 Installation of the motoscope mini

To ensure correct fastening two metric fastening screws must be used (M3). In order to avoid distortions of the threaded bores, the fastening bolts must be screwed into the instrument housing to a minimum depth of 3 mm and a maximum depth of 5 mm. It is therefore important to select screws appropriate to the thickness of the used mounting bracket. We also recommend the use of additional washers and screw adhesive (e.g. Loctite medium-strength). Furthermore, the **maximum torque** applied to the M3 fastening screws must not exceed **4 Nm**.

# 8 Connecting of the motoscope mini and the wiring harness

### 8.1 Cable routing recommendations

Before routing cables look for suitable cable paths. The cables should be as far away as possible from hot parts of the engine. Look for a suitable place for the respective cables to meet with their plugs and for the plugs to be connected with one another. This is usually in the headlight housing or somewhere below the gas tank. Make sure you take note of the required lengths of cables before cutting them for best fit. It is important here to consider the full lock of the handlebars as well as the front and rear wheel travel. All cables should be routed free of kinks and should not be subject to any tension. In addition, the cables have to be properly isolated, especially in places where mechanical wear can take place. We recommend solder joints. For fastening the cables we recommend cable ties of synthetic material.

#### 8.1.1 Cable colours, functions, and connections

| motoscope mini |  |  |  |  |
|----------------|--|--|--|--|
| Cable colour   | Function   | Connection   |  |  |
| Red            | Voltage supply   | Plus (+) "switched" and <b>5A fused</b> voltage of the wiring harness)                       |  |  |
| Black          | Earth connection   | Minus (-) (vehicle earth)  |  |  |
| Yellow         | Signal cable of the rev. counter Attention! This cable must not be connected to the high-voltage side of the ignition! |  |  |  |
| White          | Connection of the <i>motoscope</i> to the speed sensor   | Leads to the signal cable of the OEM speed sensor, or delivered sensor that switched to +12V |  |  |
| Green          | Cable for the menu pushbutton  | Leads to the pushbutton that switches to earth   |  |  |
| Blue           | No function  | Not connected  |  |  |

# 8.2 Battery and voltage supply

The *motoscope mini* requires "**switched plus**" for the voltage supply. That means electrical power will flow if ignition lock is switched "on". The *motoscope mini* can operate in a voltage range from 7 V to 18 V DC. Operating the instrument without a battery, for example, using a direct connection to the vehicle's generator is not envisaged or recommended! Please ensure that the polarity of the voltage supply is correct.

**Attention!** The minimal supply cable width is 0,75mm<sup>2</sup>. You must fuse the +12V power supply cable with a 5A fuse. If device will be use without fuse, damage at the connecting cable or the motoscope itself can cause a shortcut and a cable fire. There may be risk of your life! Make sure you are capable to connect the instrument properly. If you are not sure, let the shop do the job!

### 9 Installation and connection of sensors and the pushbutton

#### 9.1 The pushbutton

To operate the instrument a pushbutton is to be connected. Therefore connect one of its terminals with the green cable of the *motoscope mini* and the other one with earth. Polarity is not relevant (see diagram in chapter 16.1).

#### 9.2 Rev counter sensor cable

The rev. counter sensor cable is yellow. It transmits the signals from the ignition to the device. Connect the yellow cable to the negative terminal (-) of one ignition coil or to the corresponding terminal of the ignition box [clamp 1 or earth]. In the case of existing rev counter output, connect the yellow cable directly with this output cable.

**Attention!** This cable must not be connected to the high voltage output of the ignition. In case of a CDI ignition, the positive pole of the ignition capacitor must be connected!

#### 9.3 Installation and connection of the speedometer sensor

The delivered speedometer sensor is a dry reed contact, which is triggered by a magnetic field. Therefore, the delivered magnet must be attached to the wheel with 2k epoxy glue. It doesn't matter if the magnet is attached far or close to the wheel centre. The speedometer sensor has to be attached to the vehicle by using a self made holding bracket. The sensor tip has to be fastened parallel to the magnet's surface. The gap between the magnet and the sensor must not exceed 4 mm and the sensor must not touch the magnet or any other rotating parts. The sensor holding bracket has to be made sufficiently stable in order to prevent any distance changes during any driving situations. The maximum mounting torque of the sensor nuts is 2 Nm. For secure mounting we recommend to use screw adhesive (medium strength). Subsequently, connect one cable of the speedometer sensor with +12 V ("switched plus") and the other one with the white cable of the motoscope mini. Polarity is not relevant (see chapter 16.1)

**Attention!** If one end of the delivered speedometer sensor is connected with +12V and the other open end touching vehicle earth accidentally, the sensor will be destroyed. The magnet will defective, if it is exposed temperatures higher than 100°C or 212°F (i.e. hot brakes).

If your vehicle comes with a three wire OEM speedometer sensor which provides an output signal higher than +5V you can use the sensor with the instrument. Therefore the delivered load resistor must connect between speed sensors supply voltage and signal output (see chapter 16.1). Now connect the motoscope mini white cable directly with the speed sensor signal output. You must perform a teach-in procedure to adjust the motoscope mini (see chapter 12.1.1).

# 10 Putting the instrument into the initial operation phase

Once all parts are installed securely and all cables are connected properly re-connect the battery and switch on the ignition or voltage supply. If the electrical connection is correct, the start display "motogadget" will appear. After this, the display will switch automatically to the speed indication. If this doesn't happen, turn off the ignition immediately and re-check all connection terminals and cables on the instrument systematically.

# 11 Operation and use of the instrument

### 11.1 General instructions for operation

All functions of the instrument are activated using only one pushbutton. Press the button for different times provides access to different levels of the display and the setup menu.

The system distinguishes between three times stages. For easy navigation in the setup menu, the time stage will be shown in the rev counter bar as follows:

**Time Stage 1: < 1 sec**One third of the bar is illuminated. Function: primarily

selection of the next option or setting a number read-

out.

**Time Stage 2: 1 sec – 3 sec**Two thirds of the bar are illuminated. Function: primarily

selection of the next/subordinate level or selection of

the next digit. Deletion of stored values.

Time Stage 3: > 3 sec The full bar is illuminated. Function: primarily selection

of the previous/primary level or leaving the menu item.

Please find the exact sequences for the setup menu in the flow chart (appendix 16.2).

### 11.2 Analogue indication of the engine speed using the LED bar

The rev. counter bar in the first line of the display can be adjusted in scales of 0 - 6.000, 0 - 8.000, 0 - 10,000, 0 - 14,000 and 0-16.000 rpm. This must be pre-defined in the setup menu.

After entering the specific parameters of the vehicle and the correct rev. counter scale into the set-up menu, the LED bar should show the correct engine speed on the display. If the engine speed indication is not satisfying, please select another input filter (InpF) in the setup.

#### 11.3 Speed indication (in km/h or mph)

The current vehicle speed is shown under the menu point "Speed" (standard display). The measurement range is between 0 and 999 km/h or mph. If the function "auto back" is activated (Setup/Displ/aback), the display will switch automatically back to the speedometer display after a predefined time. If the chosen time is set to 00 s the function "auto back" is deactivated. Only in this setting the current display will appear after a restart of the instrument.

#### 11.4 Trip odometer (in km or mi)

Under the menu point "**Trip**" the trip odometer function shows the current day mileage. The distance covered is indicated by a value between 0 and 999.99 km or mi. After reaching the latter value the counter starts again at 0 mi or km. The highest values are permanently stored. They can be deleted by keeping the menu button pressed.

### 11.5 Total odometer (in km or mi)

The total odometer shows the total distance covered since the instrument was put into operation, provided that no other starting value has been entered. The reading can be shown in kilometres or miles. The value remains stored even if the entire board is switched OFF. The total odometer can be reset to 0 within the special sub-menu "RESET/ALL" in the set-up. If you wish to enter starting values other than zero they can be set under "RESET/ODO".

#### 11.6 Engine speed indication on the display (in rpm)

This function shows the current engine speed as a numerical value on the display in a range between 0 and 20,000 rpm. This indication also requires vehicle specific pre-settings in the setup menu.

#### 11.7 Time counter for the current ride (hh:mm:ss)

The time counter for the current ride (stop-watch) measures the actual riding time because counting stops when the vehicle stands idle. The riding time is recorded to the precise second up to 99 hours, and 59 minutes. If the measured time amounts to less than 59 min and 59 s the display shows minutes and seconds (mm.ss). If more time than one hour elapses, the display shows hours and minutes (hh:mm). The recorded time remains also stored when voltage is switched off. The time value can be set to zero any time keeping the pushbutton pressed.

### 11.8 Threshold indication of the engine speed (shift light)

When a pre-adjusted engine speed value is reached (SETUP/ DISPL/ FLASH) all LEDs of the display flash with a frequency of 5 Hz and with maximum brightness.

# 12 The Setup menu (adjusting the instrument)

All operations, adjustments, and calibrations of the *motoscope mini* are carried out using a single pushbutton. For this reason the internal design of the setup is laid out in logical "levels." The selection of and access to these levels as well as to their sub-points is controlled using different button compression times. The different times are represented visually by a horizontal LED bar in the first line of the display. This optical control ensures an easy navigation as well as a correct input of data.

In order to enter the set-up menu the pushbutton has to be engaged in the "Speed" mode until "Setup" appears in the display. Subsequently, the sub-point Param appears. Within this sub-point three different levels can be chosen (Param, Displ and Reset) by compressing the pushbutton for a short of time (time stage 1).

#### 12.1 The level PARAM (vehicle-specific adjustments)

The navigation to this sub-point is explained by the diagram in the appendix (section 16.2). Within this level the vehicle-specific values are entered which are needed for the indication of the driving and engine speed. Within the level the sub-points **Teach**, **Circ**, **ImpW**, **ImpE**, and **Ver** can be chosen.

#### 12.1.1 Teach

The sub-point **Teach** affords an automatic calibration of the speedometer. To use this function, the vehicle must be driven constantly at exactly 50 km/h (31 mph) while a 5 second countdown elapses To start the teaching push the button for time stage 2. After the countdown has elapsed, the device stores the calculated values and returns to the standard display.

### 12.1.2 Circ (Circumference)

The value **Circ** represents the circumference of the tire in millimetres which the magnet and the speedometer sensor is attached to.

The suitable tire circumference can be choosen from the table in chapter 16.3.

If the tire size is not listed in the table; measure the tire circumference, with the aid of a cord. Subsequently, add a speedometer advance of 5% by multiplying the measured value by 1.05. In order to count up the individual digits representing the measured tire circumference engage the pushbutton for time stage 1. In order to go to the next digit, push the button for time stage 2. In order to leave the menu push the button for time stage 3. If the function Teach is used, nothing has to be adjusted under **Circ**.

#### 12.1.3 ImpW (Impulses Wheel)

**ImpWHL** represents the number of impulses transmitted from the speedometer sensor per wheel turn. If only one magnet is used, no changes are necessary in the setup (default value is 1). If the genuine speedometer sensor is used, the amount of output impulses per wheel turn have to be set. Pressing the button for time stage 1 will change the current number. Time stage 2 will switch to next number. Time stage 3 will leave the menu. If the function **Teach** is used, nothing has to be adjusted under **ImpW**.

#### 12.1.4 ImpE (Impulse Engine)

The function **ImpE** sets the calibration of the rev. counter by entering the number of ignition impulses generated per crankshaft turn. This value can depend on the number of cylinders, the engine construction and/or the type of ignition (e.g. lost spark or not). If the entered factor is incorrect, the engine speed displayed is usually either half or double the true value. If your vehicle has several ignition coils only the impulses from one coil are relevant, namely the coil to which the yellow signal cable is attached. Possible values range from 0.25 to 9 impulses. If "10" is reached, the **ImpE** value starts again at 0.25. In order to set the value engage the pushbutton for a short time (1 bar appears). To leave menu press menu button until 2 bars appear. *Example of use: A single-cylinder four-stroke engine with one ignition coil = one ignition impulse at 2 crankshaft turns. The resulting value to be entered would be 0.5.* 

#### 12.1.5 ImpF (impulse filter)

The function **ImpF** offers a choice of four filters - A, B, C or D - for the engine speed indication. If the driving engine speed indication does not work satisfactorily with the factory-set filter B, please try one of the other filters.

#### 12.1.6 Ver 1. X

This point shows the current software version. Here you can also activate or deactivate the Fast – Display – Modus. If activated, the speed of the display scrolling is increased by 100%. Leave this sub-menu with button stage 1. Press menu button stage two for activation / deactivation of the Fast – Display – Modus. Leave the PARAM menu with button stage 3.

# 12.2 The level "Displ" (display)

All display relevant parameters can be adjusted within this menu. The level **Displ** includes the sub-points **Unit**, **Scale**, **Day**, **Night**, **Flash**, **Aback and VertM**, which can be adjusted individually.

#### 12.2.1 Unit

Within this function the display indication can be changed from kilometers to miles (or v.v.) by pressing the push button for time stage 1 (one bar appears). In order to leave the sub-point engage the push button for time stage 2 (two bars appear).

#### 12.2.2 Scale

With this function the setting of the LED engine speed indication is carried out. By pressing the pushbutton for time stage 1 (one bar) the engine speed value can be set to 6.000, 8.000, 10.000, 12.000, 14.000 or 16.000 (rev./min). In order to leave the sub-point engage the pushbutton for time stage 2 (two bars).

### 12.2.3 Day

The *motoscope mini* features an integrated brightness sensor that distinguishes between daylight (**Day**) and darkness (**Night**).

Within the sub-point **Day** the brightness of the LED display can be adjusted for daylight. The sub-point Day provides the modes **low**, **med**, **high** or **high+.** In order to choose one of these modes the push button has to be engaged for time stage 1 (one bar).

In order to leave the sub-point engage the push button for time stage 2 (two bars).

Note: If the mode " high+" is activated a sufficient heat sink must be ensured. Such a heat sink could be a holding bracket made of aluminum or steel, to which the two fastening bolts of the device must have a direct contact. If no heat sink is possible, e.g. at an integrated gas tank fitting, the outside temperature of the device can reach temperatures of up to 75° C. The device switches off when the temperature exceeds a factory-set maximum. In such case the brightness should be reduced to " high".

#### 12.2.4 Night

Within this sub point the brightness of the LED display is set for darkness. The modes **low**, **med**, **high** or **high+** can be set by engaging the push button for time stage 1 (one bar). In order to leave the sub menu engage the push button for time stage 2 (two bars).

#### 12.2.5 Flash (shift light)

A threshold value for engine speed can be set within the sub-point **Flash**. The setting is used for the adjustment of a simulated gear shift light. When exceeding the adjusted value all LEDs of the display flash with maximum brightness and with a frequency of 5 Hz.

In order to select individual digits representing the desired threshold engage the pushbutton for time stage 1 (one bar). In order to go to the next digit, engage the button for time stage 2 (2/3 of the LED bar). In order to leave the level, operate the pushbutton for time stage 3 (3/3 of LED bar).

### 12.2.6 Aback (auto back)

This function controls the time after the current screen jumps back to the driving speed indication automatically. The factory setting is 30s. If the value is set to "00" the function is deactivated. Only in this setting the current screen will appear again after a restart of the instrument. In order to select individual digits representing the chosen time press the push button for time stage 1. For the next digit push the button for time stage 2. Leave the menu by pressing the push button for time stage 3.

#### 12.2.7 VertM (vertical mode)

If the instrument shall be mounted in a vertical position or upside down, the function **VertM** makes it possible to rotate the display by 90°, 180° or 270°.

Within the submenu you can choose between the options "std", "left", "right" and "up/dn".

The option "std" activates the standard horizontal display, "left" the vertical display with the rev. counter bar on the left side, "right" the vertical display with the rev. counter bar on the right side and "up/dn rotate the display up side down. Press push button time stage 1 to change the option. Choose the option and leave this sub menu with push button time stage 3.

#### 12.3 The level "RESET"

Under **RESET** all or individually selected values can be set to 0 or to their default values. Furthermore, the total odometer reading can be set to an individual value (e.g. to the former odometer reading). Within the level **RESET** the sub-points "odo" and "all" can be chosen.

#### 12.3.1 Odo (Odometer)

The sub-point "**ODO**" allows the adjustment of the total odometer reading. In order to scroll through the digits, engage the pushbutton for time stage 1 (one bar). To move to the next number position engage the button for time stage 2. To leave the sub-point engage the button for time stage 3.

#### 12.3.2 All

Within the function "ALL" all adjustments and entered data will be deleted, including the total odometer readings, and the default values will be restored!

!Important! If this function is activated the following should be considered:

Engaging the pushbutton for time stage 2: Deletes everything and leaves the menu.

Engaging the pushbutton for time stage 3: Leaves the menu without deleting anything.

# 13 Cleaning of the instrument

Use only gentle, non-corrosive detergents and a soft cloth for cleaning the *motoscope mini*. Avoid anything that might scratch the aluminium housing and the display surface. Should any scratching occur, we recommend special polishing pastes in order to remove them from the display. Such pastes can be found, for example, in equipment stores for mobile telephones. Furthermore, we suggest the use of silicon spray from time to time. This keeps the colour of the anodised housing fresh and protects the instrument from dirt.

# 14 Safety instructions

The *motoscope mini* provides a lot of information at one time. Users consequently require a certain "training" period in order to recognise all the given information quickly and correctly. Please take this into account, particularly during your first rides with the *motoscope mini* and do not distract yourself by watching the instrument in public traffic.

The user of the instrument is responsible for the correct entry of all relevant data as well as for the adjustment of the speedometer and all other functions. In particular, the fitting of the dry reed contact as well as the input of all calculation factors for speed determination must do with great care. The user is also responsible for mounting the instrument, the sensors, and all other accessory parts to the vehicle correctly and securely.

# 15 Trouble shooting

#### 15.1 After the installation

- Make sure the supply voltage is minimum 7V. Check the vehicles battery.
- Do not use a battery charger to test the Instrument.
- Check all cables for correct installation and contact.
- Check all cables, for correct polarities and short-circuits.

#### • Defective Instrument? So you can check instruments inputs and functions by yourself:

- perform a reset
- disconnect all wires from vehicle wiring loom
- connect only +12V to the red cable and Earth to the black cable
- now the display must be illuminated, if not check the power source and cables for polarity
- inch the green cable to earth until you see the Speedometer screen (Speed)
- inch the white cable to +12V if you can see now any numbers, this input is working correctly
- inch the green cable to earth until you see the Engine Speed screen (RPM)
- inch the yellow cable to earth, if you can see now any numbers, this input is working correctly
- If this test was successful, the instrument is working correctly check your connections to the vehicle. If the test was not successful you have to return the instrument for change

# 15.2 Return and complains

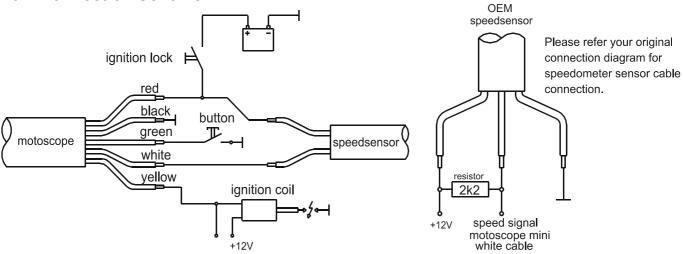
If you like to return a defective instrument for repair or change please observes following issues:

- Make sure again there is no connection failure. In doubt use a different voltage source to recheck.
- Not prepaid shipments will be rejected.
- The Shipment to motogadget is carried out by your own risk you are responsible for a sufficient insurance.
- Make sure the package is adequate.
- Attach the invoice and a failure description with Motorcycle model and year.
- If you are located outside the EU, you have to declare "repair item" and value 1 Euro in shipment custom declaration.

The *motogadget* team wishes you pleasant and safe riding, and lots of fun with your new *motoscope mini*.

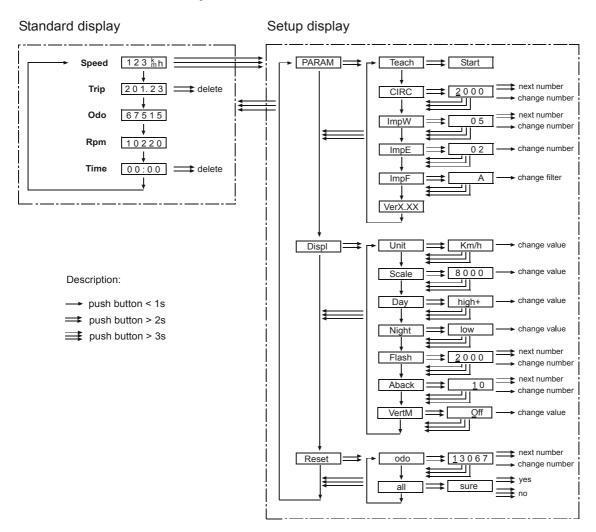
# 16 Appendix

#### **16.1 Connection Scheme**



- a) connection diagram for motogadget speed sensor
- b) connection diagram for OEM sensor

# 16.2 General overview of operation



# 16.3 Table of tire circumferences

| Zoll | Reifendimension              | Abrollumfang für |
|------|------------------------------|------------------|
| Inch | Tyre Size                    | ABE / Gutachten  |
| 16   | 100/90 16                    | 1770             |
| 16   | 110/90 16                    | 1824             |
| 16   | 120/80 16                    | 1806             |
| 16   | 120/90 16                    | 1878             |
| 16   | 130/70 16                    | 1776             |
| 16   | 130/90 16                    | 1933             |
| 16   | 150/80 16                    | 1951             |
| 16   | 140/90 16                    | 1987             |
| 16   | 150/80 16                    | 1951             |
| 16   | 160/80 16                    | 1999             |
| 16   | 180/60 16                    | 1878             |
| 16   | 180/70 16                    | 1987             |
| 16   | 200/60 16                    | 1924             |
| 16   | 240/50 16                    | 1951             |
| 17   | 100/80 17                    | 1788             |
| 17   | 110/70 17 54 H TL            | 1770             |
| 17   | 110/70 V 17 V 250(54V) TL    | 1770             |
| 17   | 110/70 V 17 V250 (54V) TL    | 1770             |
| 17   | 110/70 ZR 17 54 W TL         | 1770             |
| 17   | 110/80 - 17 57 H TL          | 1836             |
| 17   | 110/80 -17 57 H TL           | 1836             |
| 17   | 120/60 ZR 17 (55W) TL        | 1740             |
| 17   | 120/70 - 17 58 V TL          | 1812             |
| 17   | 120/70 B 17 M/C 58 V TL      | 1812             |
| 17   | 120/70 ZR 17 (58W) TL        | 1812             |
| 17   | 120/80 - 17 61 H             | 1884             |
| 17   | 120/80 - 17 M/C 67H reinf.   | 1884             |
| 17   | 120/80 -17 M/C 67H reinf. TL | 1884             |
| 17   | 120/90 - 17 rear             | 1957             |
| 17   | 130/60 ZR 17 59W TL          | 1776             |
| 17   | 130/70 17 62 H TL            | 1854             |
| 17   | 130/70 ZR 17 62W TL          | 1854             |
| 17   | 130/80 - 17 65 H TL          | 1933             |
| 17   | 130/80 - 17 65 H TL          | 1933             |
| 17   | 130/80 - 17 65 S             | 1933             |
| 17   | 140/80 - 17 69 H             | 1981             |
| 17   | 140/80 - B 17 M/C 69 H TL    | 1981             |
| 17   | 140/80 B 17 M/C 69H TL       | 1981             |
| 17   | 150/60 ZR 17 66W TL          | 1848             |
| 17   | 150/70 17 69 H TL            | 1939             |
| 17   | 150/70 17 69 V TL            | 1939             |
| 17   | 150/70 R 17 69 H TL          | 1939             |
| 17   | 150/70 ZR 17 (69W) TL        | 1939             |
| 17   | 150/80 17                    | 2029             |
| 17   | 160/60 VB 17 (69V) TL        | 1884             |
| 17   | 160/60 ZR 17 (69W) TL        | 1884             |
| 17   | 160/70 B 17 73 V TL          | 1884             |
| 17   | 160/70 ZR 17 73 W TL         | 1884             |
| 17   | 170/60 VB 17(72V) TL         | 1921             |
| 17   | 170/60 ZR 17 (72W) TL        | 1921             |
| 17   | 180/55 ZR 17 (73W) TL        | 1903             |
| 17   | 180/55 ZR 17 V300 (73W) TL   | 1903             |
| 17   | 190/50 ZR 17 (73W)TL         | 1878             |
| 17   | 200/50 ZR 17 (75W) TL        | 1919             |
| .,   | 200/00 Zit II (1000) IL      | 1010             |

| Zoll       | Reifendimension                                | Abrollumfang für |
|------------|--|------------------|
| Inch       | Tyre Size                                      | ABE / Gutachten  |
| 18         | 90/90 - 18 51 H TL                             | 1869             |
| 18         | 100/90 - 18 56 H                               | 1924             |
| 18         | 100/90 - 18 56 H TL                            | 1924             |
| 18         | 100/90 - 18 61 H TL                            | 1924             |
| 18         | 100/90 - 18 M/C 61 H TL                        | 1924             |
| 18         | 110/80 - 18 58 H TL                            | 1912             |
| 18         | 110/80 - 18 58 H TL                            | 1912             |
| 18         | 110/80 - 18 M/C 58 S                           | 1912             |
| 18         | 110/90 18                                      | 1978             |
| 18         | 110/100 18                                     | 2099             |
| 18         | 120/70 ZR 18 59W TL                            | 1888             |
| 18         | 120/80 - 18 62 H TL                            | 1960             |
| 18         | 120/80 - 18 62 S                               | 1960             |
| 18         | 120/90 - 18 65 H TT/TL                         | 2032             |
| 18         | 120/90 - 18 M/C 61 H TL                        | 2032             |
| 18         | 130/70 18 63 H TL                              | 1930             |
| 18         | 130/70 B 18 69 H reinf. TL                     | 1930             |
| 18         | 130/80 18<br>140/80 - 18 70 R                  | 2008             |
| 18         | 150/70 VB 18 TL                                | 2057             |
| 18         |  | 2014             |
| 18         | 160/60 VB 18 V280 (70V) TL                     | 1960             |
| 18         | 160/60 ZR 18 (70W) TL                          | 1960             |
| 18         | 170/60 VB 18 V280 (73V) TL                     | 1996             |
| 18         | 170/60 ZR 18 (73W) TL                          | 1996             |
| 18<br>18   | 180/55 18                                      | 1981             |
|            | 200/50 18                                      | 1951             |
| 18<br>18   | 240/40 18<br>3.00 - 18 47 S                    | 1960<br>1894     |
| 18         | 3.00 - 18 52 M reinf.                          |                  |
| 18         | 3.00 - 18 52 M reini.<br>3.00 - 18 52 P reinf. | 1894<br>1894     |
| 18         | 3.25 - 18 52 H                                 | 1930             |
|            | 3.25 - 18 52 S                                 |                  |
| 18<br>18   | 3.25 - 18 52 S<br>3.25 - 18 59 P reinf.        | 1930<br>1930     |
| 18         | 3.25 - 18 59 P reinf.                          | 1930             |
| 18         | 3.50 - 18 56 S                                 | 1960             |
|            | 3.50 - 18 62 P reinf.                          | 1960             |
| 18<br>18   | 3.50 - 18 62 P reinf.                          | 1960             |
|            | 400400 40 == 11 == /=:                         | 2222             |
| 19<br>19   | 100/90 - 19 57 H TT/TL<br>110/90 - 19 62 H TL  | 2002<br>2057     |
| 19         | 110/90 - 19 62 H TL<br>110/90 19 57 S TL       | 2057             |
| 19         | 3.00 - 19 49 S                                 | 1972             |
| 19         | 3.00 - 19 54 P reinf.                          | 1972             |
| 19         | 3.25 - 19 54 H TT/TL                           | 2008             |
| 19         | 3.25 - 19 54 P                                 | 2008             |
| 19         | 3.25 - 19 54 S TT/TL                           | 2008             |
| 19         | 3.25 - 19 54 V TL                              | 2008             |
| 19         | 3.50 - 19 57 H TT/TL                           | 2038             |
| 19         | 3.50 - 19 57 P                                 | 2038             |
| 19         | 3.50 - 19 57 S TL                              | 2038             |
| 19         | 3.50 - 19 57 V TT/TL                           | 2038             |
| 21         | 80/90 - 21 48 H                                | 2045             |
| 21         | 80/90 - 21 54 H TL                             | 2045             |
| 21         | 90/90 - 21 54 S                                | 2099             |
| <b>4</b> 1 | 30/30 - Z I J+ J                               | 2033             |