



# ***CCS1-TPS***

***Kit for Off Road and Supermoto***

**Installation and  
User Manual**

**MADE IN ITALY**

## INTRODUCTION

Congratulations for purchasing our Electronic Gear Kit!

The CGS (Clutchless Gear System) is a device which makes it possible to engage the next gear without releasing the throttle and without using the clutch during fast sports use of your motorbike.

The Off-Road and SuperMoto CGS1-TPS Kit consists of a mechanical sensor (*sMec*, *Figura 1*), a box containing the control electronics (*eBox*, *Figura 2*), a module for managing ignition (MGA, *Figura 3*), a handlebar on-off switch for activating or deactivating it and a harness for connecting the various kit components and the motorbike's electrical system, with connectors compatible with those of the motorbike's electrical system (Plug&Play) and realized using materials for automotive applications.



**Figura 1: Sensore (sMec)**



**Figura 2: eBox**



**Figura 3: MGA**

When you operate by means of the sMec the CGS1 controls a cut-off time that lets the rider engage the next speed without releasing the throttle and/or engaging the clutch. The cut-off time can be set between 10 and 99 ms and is displayed by means of a two-figure red LED display unit located in the eBox (*Figura 9*). It also makes it possible to set the rotation speed below which the device does not intervene.

Inspired by the need to make shifting faster on the circuit and let the rider concentrate more effectively, both physically and mentally, on riding the motorbike, the CGS1 Kit is not suitable for use at low rotation speeds and/or at slow tourism speeds. Deactivating it is therefore recommended whenever you are not riding in closed circuits.

### NOTE

**If this manual is not complete or does not contain all the information you require, please contact us without hesitation. We are at your disposal for every clarification and for any suggestions regarding both this manual and our products.**

## ATTENTION

- The CGS1 Kit is not an approved device for use on the public road
- The use of the CGS1 Kit increases stress on the vehicle transmission system
- Incorrect installation of the electrical part can detrimentally affect the proper operation and/or integrity of the CGS1 Kit and/or of the vehicle's electrical system.
- The installation of the CGS1 Kit must be carried out by an engineer familiar with electrical circuits

SP electronics declines all responsibility as regards the points listed above and any consequences of them, in relation to any damage caused to any part of the vehicle, to the rider or to transported third parties arising out of the installation and/or use of devices described in this manual.

## N.B.

- The specifications of this product can be subject to modification without notice.
- The contents of this manual can be subject to modification without notice.
- The manufacturer and its suppliers do not assume any responsibility towards the purchaser or towards anyone else in relation to any damages, expenses, loss of profits or any other damage resulting from the use of this product.
- The contents of this manual may not be reproduced without the manufacturer's permission.

## CONFORMITY OF THE SYSTEM

The CGS1 Kit has been designed and built in compliance with the directives of EC regulations governing electronic devices. It does not contain dangerous substances or parts which could directly damage the surrounding objects. The product does not give rise to any combustion or explosion risk.

### NOTE

**The CGS1 Kit has been designed, realized and assembled in Italy by SP electronics**

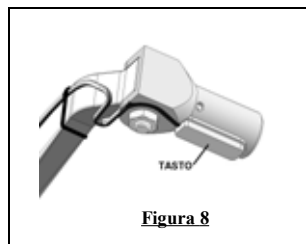
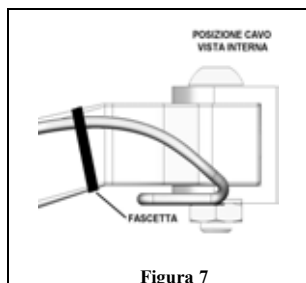
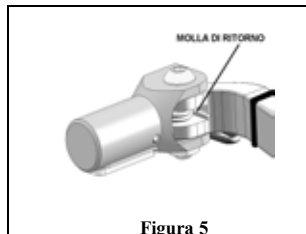
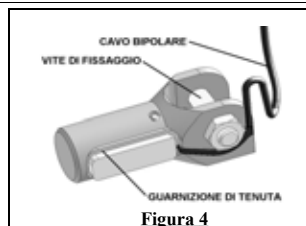
## MECHANICAL INSTALLATION

The sensor for Off-Road and SuperMoto kits adapts to the original context of the motorbike and its installation envisages the removal of the mobile head of the standard gear lever. To remove the original piece you are advised to remove the gear lever from the motorbike so as to facilitate the installation of the new component.

When you have removed the original component, install the SP sensor in its place, fixing it with the nut and bolt supplied in the kit (*Figura 4*) and making sure that you position the return spring correctly (*Figura 5*) and tighten the nut and bolt in such a way as to leave free the rotation movement which occurs in the event of falling. Pass a steel safety wire with a maximum diameter of 1 mm inside the fixing screw. Finally, ensure that the return movement is perfectly free. If it is not, check the spring or the fixing of the bolt with nut.

The most important stage for the long life of the device and for protecting it from accidents and working stress is the correct positioning of the wire. The correct way to fix the wire is shown in the *Figura 6+ Figura 7*. The wire must make two U-shaped bends which permit the free rotation of the sensor in the event of a fall or of scraping on the ground, without causing shearing or torsional stress. The gear lever is fixed by means of wire clamps.

The activation of the shifting signal takes place by means of the movement of the sensor button (*Figura 8*) actuated by the rider's foot vis-à-vis the sensor part integral with the gear lever coming out of the engine. The precision of the movement is guaranteed by a single degree of freedom by means of the cylindrical pin and by the operations for coupling the parts carried out on numerically controlled machinery. The force required for activating the signal to apply to the button is about 1 kg.



**ELECTRICAL INSTALLATION****ATTENTION!**

The installation of the CGS1 Kit must be carried out by an engineer familiar with electrical circuits. It is dangerous to modify the original wiring of the motorbike without adequate experience of the subject.

You are advised to disconnect the positive terminal of the battery before starting the installation procedure and for the whole duration of the same.

Each of these wires should be connected to the harness wire of your motorbike associated with the use indicated in the table:

<i>Identification</i>	<i>Destination</i>
<b>FEED</b>	<b>Connection to the 12v motorcycle battery where possible, or connection to the Alkaline 9v DC PP3 contained within the battery box provided in the kit.</b>
<b>COIL</b>	<b>Direct connection to the ignition module MGA</b>
<b>sMec</b>	<b>Connection to the gear lever sensor</b>
<b>SwB</b>	<b>Connection to the handlebar switch button</b>

<i>Identification</i>	<i>Additional Optional Connections For Fuel Injection Motorcycles</i>
“RPM” Blue Wire	Connection to the ECU RPM signal
“TPS” Green Wire	Connection to the ECU TPS signal (a throttle position sensor is required for this function correctly)
“GND” Black Wire	Connection to earth (ground)
“FEED” Red Wire	Do not connect this wire, instead terminate and insulate this connection

The Off-Road and Supermoto CGS1 Kit should be connected directly to the motorcycle’s battery, using the wiring connectors provided. The wire of the sMec, which is provided with a quick-fit coupling, should be connected to the harness connector of the corresponding Off-Road and Supermoto CGS1 Kit. Having completed the connection of all the wires, restore the compact appearance of the electrical system and restore any connections disconnected during the installation work..

Your motorbike’s wire colour indication for the use indicated in the table can be found in the database on our website:

<http://www.spelectronics.it/database/>

The information in the on-line database will help you to connect the device on the basis of the make, model and year of construction of the motorbike.

Once you have completed the steps described above, the device will be ready for optimum operation and will not lose the defined settings and programming even if the bike’s battery is disconnected. If you have any doubts or problems, contact us at the following addresses:

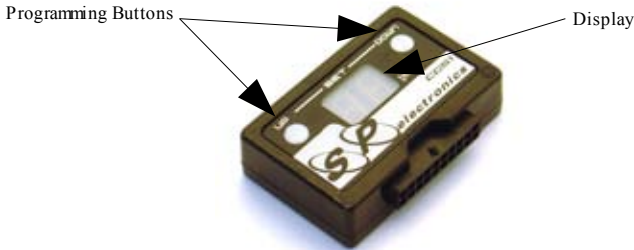
Tel. +39 0445 334 677

Mail: [info@spelectronics.it](mailto:info@spelectronics.it)

## **MAIN FUNCTIONS**

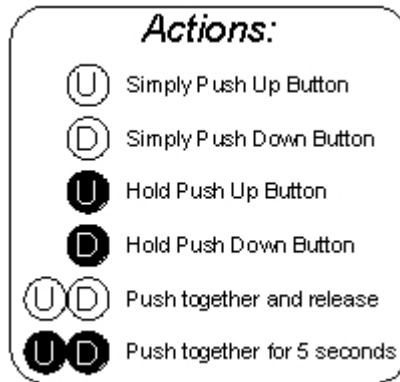
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All the functions of the CGS1 are controlled by means of the buttons in the eBox beside the display (Figura 9). There are two buttons and they carry out three basic functions: UP, SET and DOWN.



**Figura 9: Buttons and display (eBox)**

Key to the functions (Figura 10) for a better understanding of the configuration procedures illustrated in the following pages



**Figura 10: Key to the functions**

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## **TURNING THE DEVICE ON**

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When the motorbike ignition is turned on, the eBox display shows “ $\text{P}$ ” for 3 blinks; then the “ $\text{E}$ ” appears. As soon as you have installed the CGS1 Kit, check with the engine idling that pressure on the sensor (and therefore on the gear rod) leads to a drop in the engine rev speed.

## DISPLAY MODES

The electronic control unit *eBox* (Figura 10) can operate in six ways (Figura 11):

## CGSI DR-TPS: Functions Display

**Full Throttle Cut-Off time:**  
From 10ms to 99ms, step 1msec. Default Value 99ms.

**Partial Throttle Cut-Off time :**  
From "Fc" value to 99ms, step 1msec. Default Value 99ms.

**Throttle % Threshold:**  
From 50% to 75%, step 1%. Default Value 75%.  
It permits to set the throttle position threshold.  
•Below it the CGS system use the "Fc" value Cut-Off time.  
•Above it the CGS system use the "Ft" value Cut-Off time.

**RPM Threshold:**  
Default Value: disabled, CGS always enable.  
It permits to set a RPM value below which the CGS will rem an disable.

**Sensor Test Mode:**  
Everytime the CGS is not in "Sleep Mode" you can Test if the sensor works correctly.

**Sleep Mode:**  
When you do not press any function button for 10 seconds, both display will turn Off and the decimal point will start to blink for 1 second every 3 seconds (Maximum power consumption 10mA).

**ATTENTION!!!**  
These functions are displayed only when all wires are connected to your motorbike.  
(Fuel Injection Models)

Figura 11: Function Display

**FUNCTION SETTING :**

The CGS1 has been made with a two-figure display with high-efficiency luminous red LEDs. It also allows you to manage programming submenus in a simple intuitive manner.

You can setting four parameters (Figura 12):

## CGS1 OR-TPS: Functions Setting

(The following values are only for example)

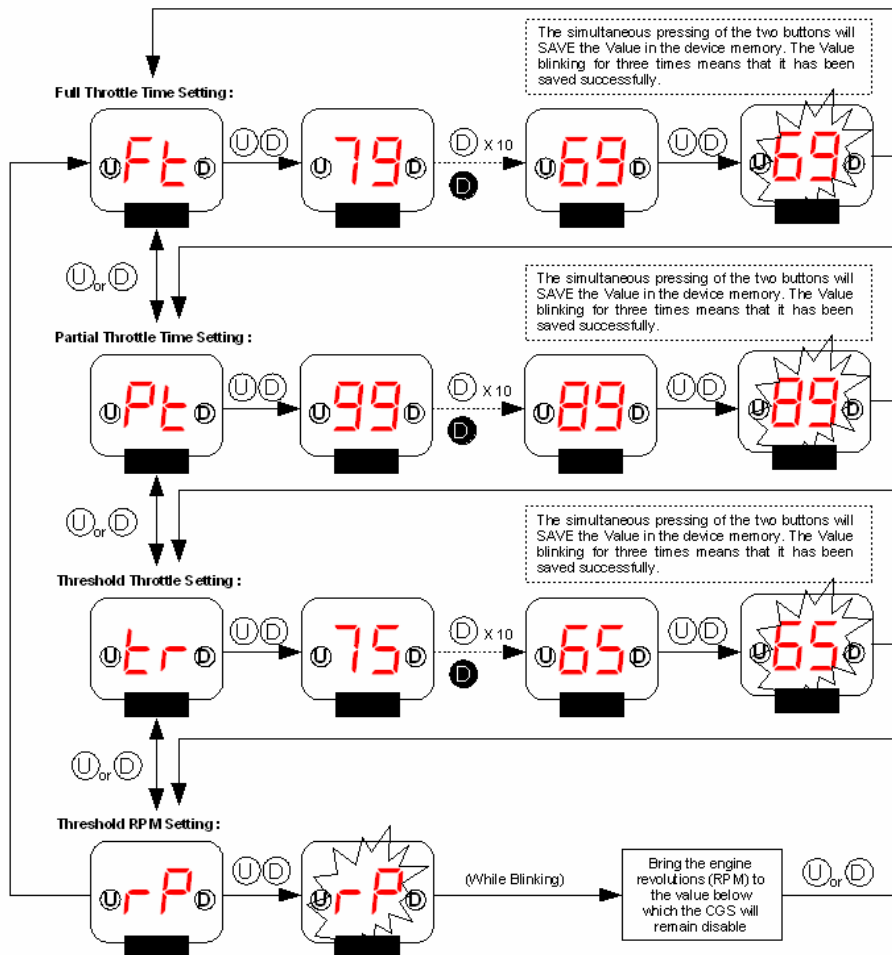


Figura 12: Functions Setting

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***SELECTING THE CUT-OFF TIME***

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The cut-off time is a time interval in which the engine stops carrying out its "power generator" function. In this time interval, the transmission of movement passes through a transitory stage during which it is possible to engage the next speed. The purpose of adjusting the cut-off is to limit the stress suffered by the drive components and limit the time during which the engine supplies limited power.

**Cut-off too long**

When using the motorbike, the engagement of the top gear is accompanied by a power gap – which may be short or long – similar to a spark plug current failure or fuel supply failure. The cut-off should be reduced.

**Cut-off too short**

When using the motorbike, the engagement of the next gear is accompanied by an impulsive metal noise, like a sharp blow to the drive components, resulting from a recovery of engine power before the next gear has been engaged perfectly. The cut-off should be increased so as not to cause damage to the drivetrain.

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***TURNING THE DEVICE OFF***

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By the handlebar (Ø 22 mm) on-off switch it is possible to switch the device ON or OFF.

You are advised to disconnect the CGS1 kit for city use and/or whenever you use the motorbike outside closed circuits.

**TECHNICAL FEATURES**

Supply voltage		9 – 16 Vdc
Maximum power consumption <sup>1</sup>	Running Mode	100 mA
	Sleep Mode	10 mA
Sensor's preload		1 kg
Sensor's material		Light alloy
Dimensions	Sensor <i>sMec</i>	20 x 20 x 54 mm
	Electronic <i>eBox</i>	58 x 40 x 15 mm
	Electronic <i>MGA</i>	56 x 35 x 16 mm
Weight <sup>2</sup>		286 g
Working temperature		-20/+70 °C
Resistant to water (not by immersion) and vibrations		

<sup>1</sup> Feeding by 12 Vdc.

<sup>2</sup> Without 9Vdc PP3 Battery.

CUSTOMER SERVICE:

0039 (0)445 334 677

(ON LINE AT 2pm TO 5pm)

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