SP ELECTRONICS
Via Ca' Fusa, 1
36030 Sarcedo

QUICK SHIFTER PVL INSTALLATION MANUAL

(Batteryless technologies)

Index :

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INTRODUCTION

The CGS (Clutchless Gear System) is a device that allows the rider, during fast sports use, to shift up a gear without closing the throttle or using the clutch. The controlled loss of power during the gear shift phase causes the torque released to the gearbox to cease for a controlled period of time (Cut-Off time), allowing for a quick and precise up-shift. It was developed to speed up gear changes on the track and allow the rider to concentrate more, both physically and mentally.

The kit consists of a single electronic control unit (eBox PVL), an electromechanical sensor to be applied to the gear shift mechanism or directly to the lever depending on the application and a Plug&Play wiring harness for connection to the vehicle's original electrical system, specific for each make and model.

The control electronics enclosure is made of ABS plastic and is fully resin-coated. Waterproof wiring and connectors for automotive applications make the device resistant to engine temperatures, oil, and hydrocarbons, as well as to water spray, even under pressure (NOT immersion), and vibrations.

This device is designed for single-cylinder, 2-stroke carbureted engines with integrated coil ignition (PVL, Selettra, MVT, Bidalot). Two eBox units are used for twin-cylinder carbureted applications.

ADVANTAGES QUICKSHIFTER

- Faster up-shifts compared to traditional gear changes.
- Reduced pitching motion during acceleration shifts.
- Improved traction thanks to reduced load transfer during gear changes.
- Allows the driver to maintain physical strength on the vehicle and concentrate more on driving.
- Reduced tire wear… which is always a plus in racing!
- The pleasure of smoother, more fun road riding!

...but also some 'DISADVANTAGES'

- Increased vehicle weight (even if minimal, we're talking about 200 g!).
- *It's addictive! …(It happens that… everyone complains… when they find themselves driving vehicles without Quick Shifter!).*

WARNINGS

- The device increases stress on your vehicle's mechanical components.
- Incorrect installation of the device may cause damage to the device and the vehicle.
- The installation of the device must be carried out by competent personnel.
- **The device is not approved for use on public roads.**
- The device is designed in accordance with European directives on electronic devices.
- The device does not contain any substances or parts that are hazardous or harmful to surrounding objects.
- The device does not pose a risk of explosion or fire.

!!! SP Electronics declines all responsibility for the points listed above in relation to damages caused to things or people including third parties involved, resulting from the use of the device !!!

!!! SP Electronics and its suppliers assume no liability to the purchaser or anyone else for any damages, expenses, loss of profits or any other damages arising out of the use of this device !!!

SP Electronics reserves the right to modify the conditions set forth in this document at any time and without notice. Any total or partial reproduction of this document in Italy or abroad is prohibited.

DEICE WAARRANTY

SP Electronics devices are covered by a 2-year warranty (1-year commercial warranty provided by the manufacturer and 1-year warranty provided by the seller/distributor by law). The warranty period begins on the date of issue of the invoice or receipt, which, in the event of a device failure, must be sent with the device. The following devices are excluded from the warranty:

- Damage caused by a fall.
- Tampering by the user.
- Damage caused by fire and/or heat beyond the limits indicated in this manual.
- Electrical damage caused by incorrect installation.

Returns Management

- Returns of material are accepted no later than 10 days from the shipping/invoicing date if coinciding.
- SP Electronics reserves the right to accept or reject the return after checking its integrity.

ELECTRICAL INSTALLATION

!!! WARNING !!! Installation of this device must be performed by a technician competent in electrical circuits and components. It is dangerous to modify the vehicle's original wiring without adequate experience. We recommend disconnecting the positive battery terminal before beginning the installation procedure and throughout the entire installation process.

The device, the only one of its kind in the world, was designed with Batteryless technology, meaning it's suitable for applications on vehicles without a battery and CDI ignition systems. Thanks to specific Plug & Play solutions for each vehicle model, the device connects directly to the ignition coil, from which it draws its power. This connection also allows for the engine ignition spark to be interrupted in a controlled manner using appropriate control logic. The individual branches are identified on the wiring harness, and their specific functions are listed below:

BRANCH	DESTINATION
GND	Battery Negative or Chassis Ground Connection
COIL	Plug&Play ignition coil connection
sMec	Connection to the electromechanical sensor

GND Connection : If the device's location in the vehicle allows it, connect this cable directly to the negative pole of the battery, otherwise connect it to a more convenient ground point. In this case, it is recommended to use an electronics tester in continuity test mode and check the electrical connection between the negative battery terminal and the chosen ground point.

COIL Connection : Each PVL, Selettra, MVT, and Bidalot engine control unit is equipped by the manufacturer with a specific wire for engine shutdown, to which the corresponding Quick Shift cable must be connected. For a 2-cylinder engine, repeat the same procedure for the second eBox unit. It is not necessary to follow a specific connection sequence!

sMec Connection : Plug & Play connection to our family of electromechanical sensors specifically for applications on the gearshift rod or directly on the gear lever. For correct installation of this device, which is part of the Quick Shifter kit, please consult the relevant manual available on our website in the CUSTOMER CARE - MANUALS category.

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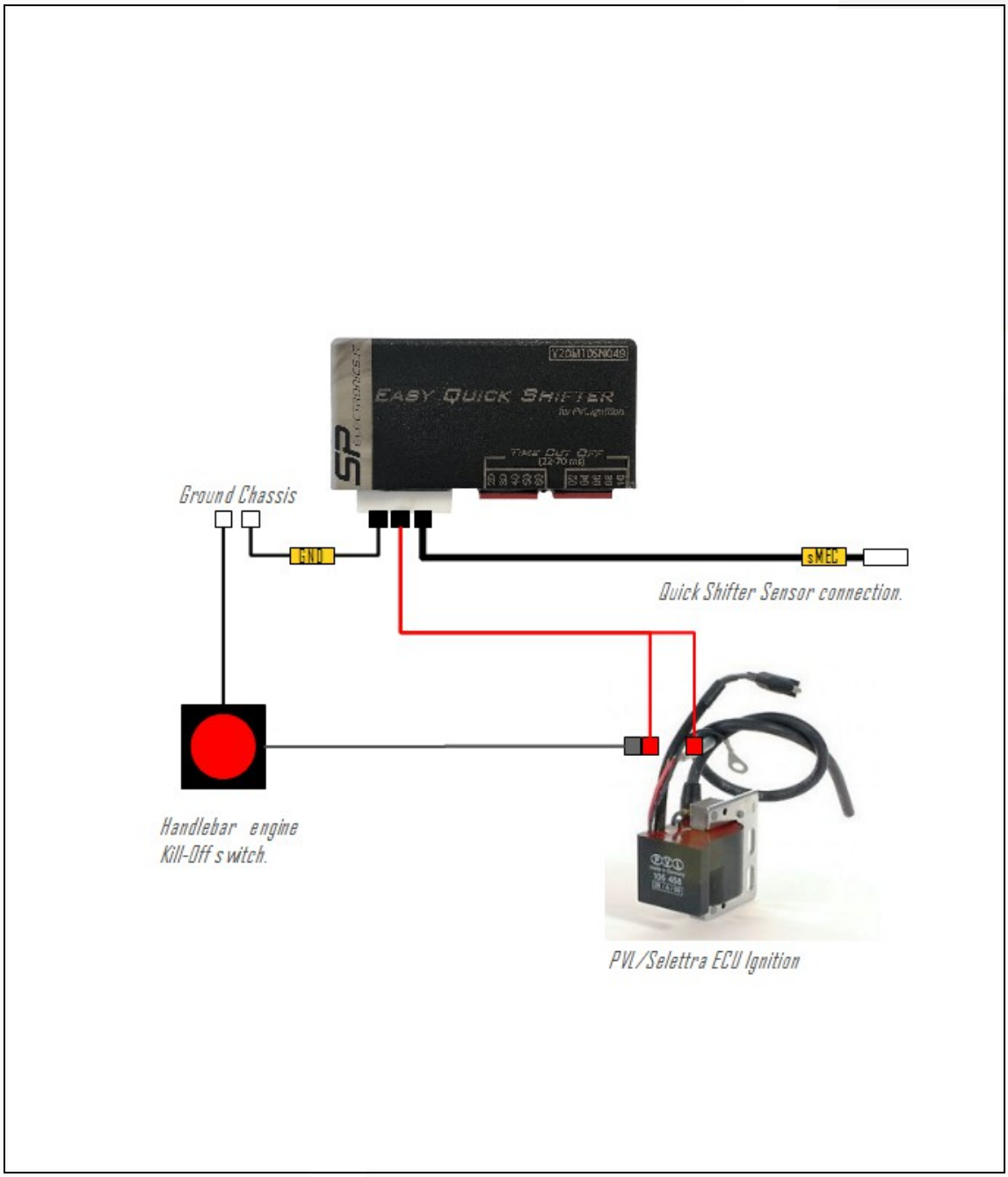
WIRING DIAGRAM



MECHANICAL INSTALLATION

PVL electronic unit : To mechanically attach the electronic unit to your vehicle, use the 3M adhesive Velcro provided in the kit. It is recommended to clean the adhesive Velcro bonding areas with a non-aggressive decreasing product on both bonding surfaces.

Typically, in applications on racing motorcycles, the electronic unit is positioned under the seat or on the frame. Therefore, use the pair of adhesive Velcro strips to secure the electronic unit away from heat sources above the operating temperature indicated in this manual (exhaust/engine head cover) and/or other moving parts that could compromise the normal operation of the vehicle and the device itself.

Electromechanical sensor : for the correct mechanical installation of this device that makes up the Quick Shifter kit, consult the relevant manual available on our web page in the CUSTOMER CARE - MANUALS category.

Plug&Play wiring : for proper mechanical installation of this device, which is part of the Quick Shifter Kit, please pay attention to the cable routing so that it is not subjected to tension/rubbing and/or contact with engine parts whose operating temperatures could damage it. Secure the cable bundle with plastic cable ties, without overtightening them. Under no circumstances should the cables coming out of a connector bent 90°; keep them in line with the connector itself.

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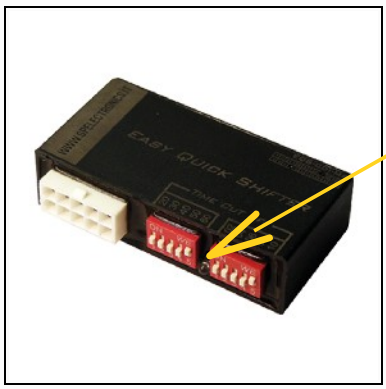
CORRECT CONFIGURATION OF THE ENGINE CUT-OFF TIME

Configuration is manual via 10 selectors, so no external device such as a PC or smartphone is required. Only the motor cut-off time can be configured, which can be selected from 22 to 70 thousandths of a second with precision in 3-millisecond increments. *The device intervenes at any rotation speed, even at idle.*

Cut-Off too high : If, when using the Quick Shifter, the up shift is accompanied by a power gap, whether long or short, similar to a lack of current in the spark plugs or a lack of fuel supply, it means that the engine cut-off time needs to be reduced.

Cut-Off too short : If, when using the Quick Shifter, the engagement of a higher gear is accompanied by an impulsive metallic noise, similar to a strong blow to the transmission components, resulting in the engine regaining power before the next gear is fully and perfectly engaged, means that the Engine Cut-Off time must be increased to avoid damage to the transmission.

LIGHT INDICATIONS



Yellow LED light : It only lights up when the sensor is activated. It is also used to perform the **" SENSOR TEST (*) ".**

(*) SENSOR TEST (only possible with the engine running at idle)

Each time the sensor is manually activated, the yellow light turns on. If this does not happen, it means that the sensor is not working properly.

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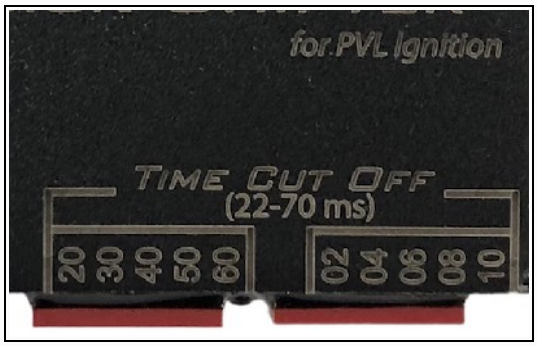
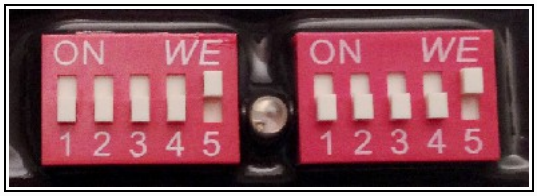
CONFIGURATION PARAMETERS





"TIME CUT OFF" parameter

(The only parameter that can be configured when the vehicle is stationary!)

Using a small flat screwdriver of adequate size to avoid damaging the selector, set the Engine Cut-Off time to the up shift condition at high engine speeds under full throttle.

The device is designed with two sets of switches: one for the tens step (20-30-40-50-60) and one for the units step (02-04-06-08-10). To correctly select the motor cut-off time, it is essential to select ONLY ONE switch for the tens step and ONLY ONE switch for the units step. The ON position activates the specific time unit.

The device is configured by the manufacturer (SP Electronics) during the final testing phase, always on the maximum time of 70 ms which is the recommended starting configuration.

Configuration example for 44 ms: set only the third selector for the tens step (40) to "ON" and only the second selector for the units step (04).

!!! ATTENTION !!! Once you have identified the correct engine cut-off time at full throttle, to cover a wider range of engine use even at part throttle, you need to increase the engine cut-off time in 3 ms increments until you reach a wider range of use that suits your riding style. A small configuration compromise is therefore acceptable to be able to shift without the clutch even at part throttle.

TECHNICAL FEATURES

Internal self-power supply voltage		5 Vdc
Maximum consummation	Running Mode	2 mA
	Sleep Mode	0 mA
ebox material		ABS Plastic
ebox dimensions		70 x 40 x 18 mm
Quick Shifter kit average weight		200 g
Operating temperature		-20/+70 °C
Water resistant (not immersion) and vibration resistant		IP66

TECHNICAL CHECKS (...in case of malfunction)

If the engine does not start It is necessary to check the electrical connections as explained on page 4 of this manual. It is advisable to start the engine only after having carried out the necessary checks.

If the engine starts If the CUT-OFF does not occur during the gear shift phase, the cause may be a malfunctioning sensor. It is necessary to perform the sensor test as explained on page 7 of this manual.

!!! ATTENTION !!! If the malfunction persists, you must open a support case available on our web page in the CUSTOMER CARE - CONTACTS category.