

QUICK SHIFTER DTI INSTALLATION MANUAL



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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 DTI), 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 2/4 stroke injection engines, from 1 to 2 cylinders.

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.

DEVICE WARRANTY

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.

Thanks to specific Plug&Play solutions for each vehicle model, the device allows for the controlled interruption of the positive +12V power supply to the ignition coil (COIL) **or** injector (INJ) 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
INJ	Plug&Play fuel injector connection
COIL	Plug&Play ignition coil connection
sMec	Connection to the electromechanical sensor
SwB	Handlebar switch connection for Quick Shifter exclusion (optional)

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.



INJ Connection : If this type of connection is provided for in the Quick Shifter wiring harness, locate the original fuel injector connector and disconnect it. Place the Plug-Socket pair of the Quick Shifter wiring harness between the original connector just disconnected and the fuel injector. In the case of an engine with 2 cylinders, repeat the operation for as many "INJ" branches as there are in the Quick Shifter wiring harness (from 1 to 2). *There is no need to follow a connection sequence!*

COIL Connection : If this type of connection is provided in the Quick Shifter wiring harness, locate the original ignition coil connector and disconnect it. Place the Quick Shifter wiring harness plug-socket pair between the original connector you just disconnected and the ignition coil. For engines with 2 cylinders, repeat the operation for as many "COIL" branches as there are in the wiring harness of the Quick Shifter (from 1 to 2). *There is no need to follow a connection sequence!*

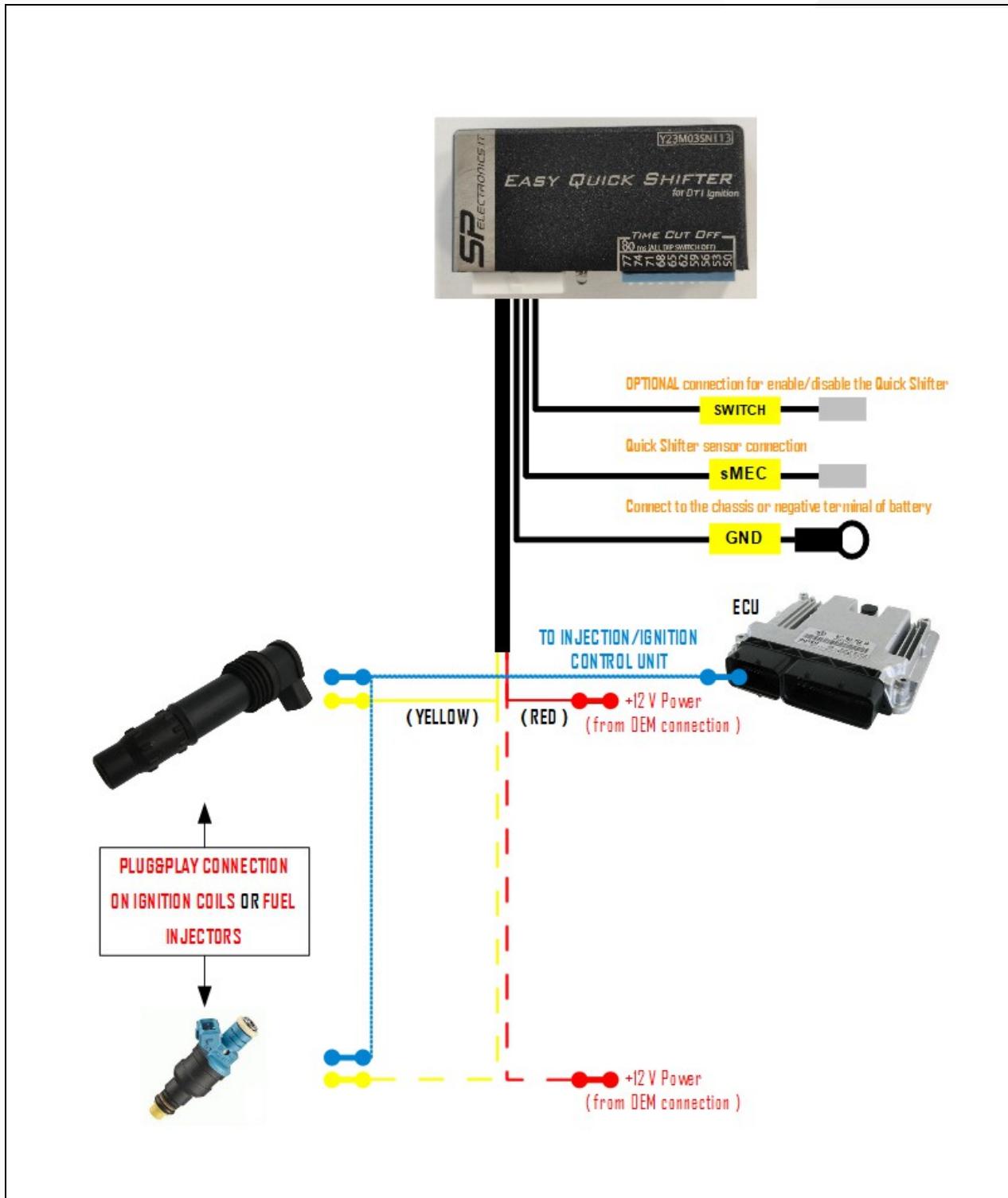
!!! ATTENTION !!! Pay close attention to the connection polarity: once the Plug&Play connection has been made to the vehicle's original connector, for correct operation and to avoid damaging the device itself and/or the vehicle, it is necessary to identify the +12V power supply to the injector or ignition coil depending on the Plug&Play solution provided. This must correspond, once the Plug-Socket pair is connected, to the RED wire of the Quick Shifter wiring harness. If this is not the case, it is necessary to reverse the position of the cables on the relevant connector or on the corresponding connector on the Quick Shifter wiring harness. To identify the +12V power supply, we recommend using the wiring diagram provided by the manufacturer and/or an electronics tester in "ON" mode. **DC voltage measurement** set to full scale 20V. Therefore, place the black terminal of the tester on the negative pole of the vehicle battery and on the previously identified and disconnected connector. With the ignition on, check with the red terminal of the tester on which of the two cables there is a direct voltage of approximately 12V. This voltage should disappear approximately 5-10 seconds after the ignition is turned off. In the case of multi-cylinder engines, it is sufficient to identify which color of wire is repeated in all the other connectors involved in the application.

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.

SwB Connection : optional Plug&Play connection to our handlebar switch device to disable the electronic gear shifting at will. This device is not included in the kit but can be purchased on our website in the ACCESSORIES category.

All our Plug & Play solutions are based on wiring diagrams provided by the manufacturers and verified through direct experience on many vehicle models from the 2000s to the present. Unfortunately, these have not always proven to be reliable in all cases and across the many different vehicle models produced over the years. We are constantly committed to verifying and updating our internal databases. We apologize in advance if any construction inconsistencies may arise. For any questions and/or clarifications, please do not hesitate to contact us!

WIRING DIAGRAM



MECHANICAL INSTALLATION

DTI electronic unit : To mechanically attach the electronics unit to your vehicle, use the 3M adhesive Velcro provided in the kit. We recommend cleaning 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.

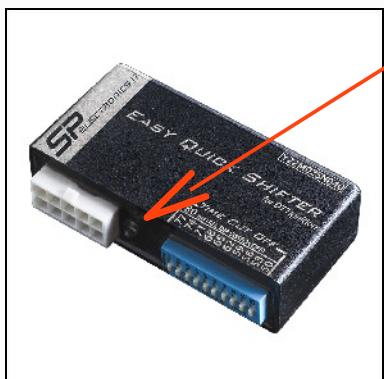
CORRECT CONFIGURATION OF THE ENGINE CUT-OFF TIME

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 50 to 80 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



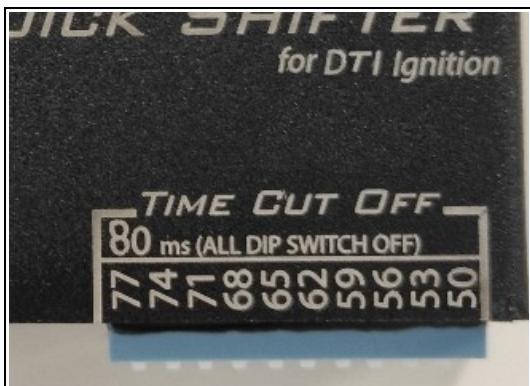
Yellow LED light: When the vehicle is started, the yellow light flashes on and off quickly, indicating that the device is working. It then only turns on when the sensor is activated. It is also used to perform the "SENSOR TEST (*)".

!!! ATTENTION !!! *A steady yellow light or fast flashing light indicates that the device is connected incorrectly. The vehicle must be turned off immediately to avoid damaging the device.*

(*) 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.*

CONFIGURATION PARAMETERS

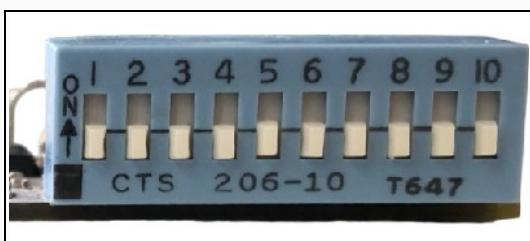
**"TIME CUT OFF" parameter**

(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 upshift condition at high engine speeds under full throttle.

The minimum configurable time is 50 ms with all selectors raised to the ON position, the maximum is 80 ms with all selectors lowered (as shown in the figure) with the possibility of increments in 3 ms steps.

The device is configured by the manufacturer (SP Electronics) during the final testing phase, always on the maximum time of 80 ms which is the recommended starting configuration.



!!! ATTENTION !!! To decrease the engine cut-off time, it is essential to progressively insert all the selectors from 1 to 10 until reaching the desired "TIME CUT OFF" time portion. If you insert ONLY the chosen one, the device will not function correctly.

!!! 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

Supply Voltage	9 – 16 Vdc
Maximum consummation (Test power supply 12 Vdc)	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 5 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 8 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.