



FuelTech



SPARKPRO

High Energy Inductive Ignition

Installation and Operation Guide

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1. Presentation

SparkPRO is a high-energy inductive ignition module with the most advanced technology in ignition power systems.

An engine ignition system is formed by the ignition timing equipment and the power component, responsible for the spark's energy.

A precise and detailed ignition timing map system also needs a potent and efficient spark for the combustion to occur properly and with the highest power possible.

SparkPRO allows electric arcs in high tensions to occur and applies 400V on the ignition's primary coil, which represents 40,000V on the ignition spark plug (with a 1:100 coil), making it possible to have a greater electrode opening than regular ignition systems (such as the ignition modules in carbureted engines).

This equipment has high current capacity and can work with low impedance coils, which results in sparks with more energy and duration.

The longer duration of the spark is actually one of the advantages of inductive ignitions over capacitive ignitions. Quality capacitive ignitions use a multiple spark system in low rotations, in which they need to stay present up to 20% of the rotation period. For example, the MSD 6-series fires approximately seven short-duration sparks at idle speed to be able to stay 20% at ignition; a high-energy inductive ignition, on the other hand, can generate the permanence of 20% with only one spark.

Another advantage of inductive ignitions is the lesser occurrence of electromagnetic noise that is generated over the engine's electric and electronic systems, which also drastically lessens the interference problems that many times harm from sound systems to electronic injection systems.

It is important to emphasize that quality capacitive ignitions generally supply sparks with more energy than inductive ignition systems, but that does not necessarily represent a gain in power, especially in engines fed with electronic injection systems, for which, normally, there is a greater control upon the mixture and less is required from the ignition system.

For being a very robust system with high-efficiency filters, SparkPRO is also recommended when problems with electromagnetic interferences cause malfunction in the ignition control system.

SparkPRO is available in versions for 1, 2, 3, 4, 5, 6 and 8 coils.

2. Characteristics

Dimensions:

- Width: 4.7in. (115mm)
- Length: 3.7in. (93mm)
- Height: 1.4in. (35mm)
- Material: Aluminum and Plastic

Electric harness:

- Version for 1 coil: 3 wires
- Version for 2 coils: 6 wires
- Version for 3 coils: 8 wires
- Version for 4 coils: 10 wires
- Version for 5 coils: 12 wires
- Version for 6 coils: 14 wires
- Version for 8 coils: 18 wires

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Cable length: 2m

Electrical specifications	Minimum	Typical	Maximum
Coil working voltage	9V	14V	20V
Max voltage on the coil primary	370V	400V	430V
Max current on the coil primary	-	-	20A @ 77 F 14A @ 257 F
Working temperature	-	-	185 F
Minimum coil resistance	0,3Ω		

3. Warranty terms

The use of this equipment implies the total accordance with the terms described in this manual and exempts the manufacturer from any responsibility regarding to product misuse.

Read all the information in this manual before starting the product installation.

This product must be installed and tuned by specialized auto shops and/or personnel with experience on engine preparation and tuning.

Before starting any electric installation, disconnect the battery.

The inobservance of any of the warnings or precautions described in this manual might cause engine damage and lead to the invalidation of this product warranty. The improper adjustment of the product might cause engine damage.

This product does not have a certification for the use on aircrafts or any flying devices, as it has not been designed for such use purpose. In some countries where an annual inspection of vehicles is enforced, no modification in the original fuel injection system is permitted. Be informed about local laws and regulations prior to the product installation.



Important warnings for the proper installation of this product:

- *Always cut the unused parts of cables off – NEVER roll up the excess as it becomes an interference capturing antenna and it can result on equipment malfunction.*
- *The black/white wire MUST be connected directly to the engine block or head. By doing so, many interference problems are avoided.*

Limited warranty

All products manufactured by FUELTECH are warranted to be free from defects in material and workmanship for one year following the date of original purchase.

Warranty claim must be made by original owner with proof of purchase from authorized reseller. This warranty does not include sensors or other products that FUELTECH carries but did not manufacture. If a product is found defective, such products will, at FUELTECH's option, be replaced or repaired at cost to FUELTECH.

All products alleged by Purchaser to be defective must be returned to FUELTECH, postage prepaid, within one year warranty period.

This limited warranty does not cover labor or other costs or expenses incidental to the repair and/or replacement of products or parts. This limited warranty does not apply to any product which has been subject to misuse, mishandling, misapplication, neglect (including but not limited to improper maintenance), accident, improper installation, tampered seal, modification (including but not limited to use of unauthorized parts or attachments), or adjustment or repair performed by anyone other than FUELTECH.

The parties hereto expressly agree that the purchaser's sole and exclusive remedy against FUELTECH shall be for the repair or replacement of the defective product as provided in this limited warranty. This exclusive remedy shall not be deemed to have failed of its essential purpose so long as FUELTECH is willing and able to repair or replace defective goods.

FUELTECH reserves the right to request additional information such as, but not limited to, tune up and log files in order to evaluate a claim.

Seal violation voids warranty and renders loss of access to upgrade releases.

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4. Installation

This module must be mounted and affixed in a ventilated place, preferably protected from the contact with water and from excessive heat, and the closest possible to the ignition coil.

It can be in contact with water as long as positioned with its connector facing down, in order to avoid the deposit of liquids on the module.

4.1 Electrical wiring connections

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Wire Color	Connection	Note
Black/White	Power Ground (engine or chassis ground)	Must be grounded to engine or chassis, not to the battery's negative terminal
Gray (1 to 8 wires)	Ignition Signal Inputs (numbered from 1 to 8)	Connected to the ignition output of the EFI module.
Green (1 to 8 wires)	Negative pulse to the ignition coils (numbered from 1 to 8)	Connect only one coil per green wire.

4.2 Ignition coils

SparkPRO may be used with any inductive ignition coil without an integrated ignition module.

The minimum resistance of the coil's primary side is 0.3 ohms. Values below this could damage the SparkPRO.

SparkPRO must not be used with coils featuring internal ignition or coils used specifically for capacitive ignitions like CDI ignitions.

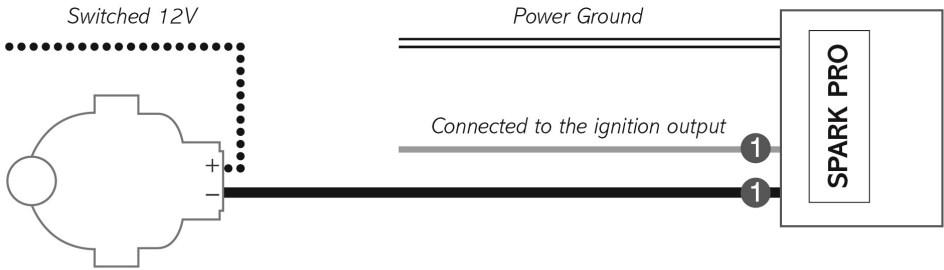
4.3 Ignition control system

SparkPRO may be used with any ignition system that controls coil charge time (Dwell Time). Ignition systems that do not control coil charge time or that have a fixed charge time in angle must not be used.

Examples:

Ignition Hall Module (with signal coming directly from the distributor);
OEM ECUs

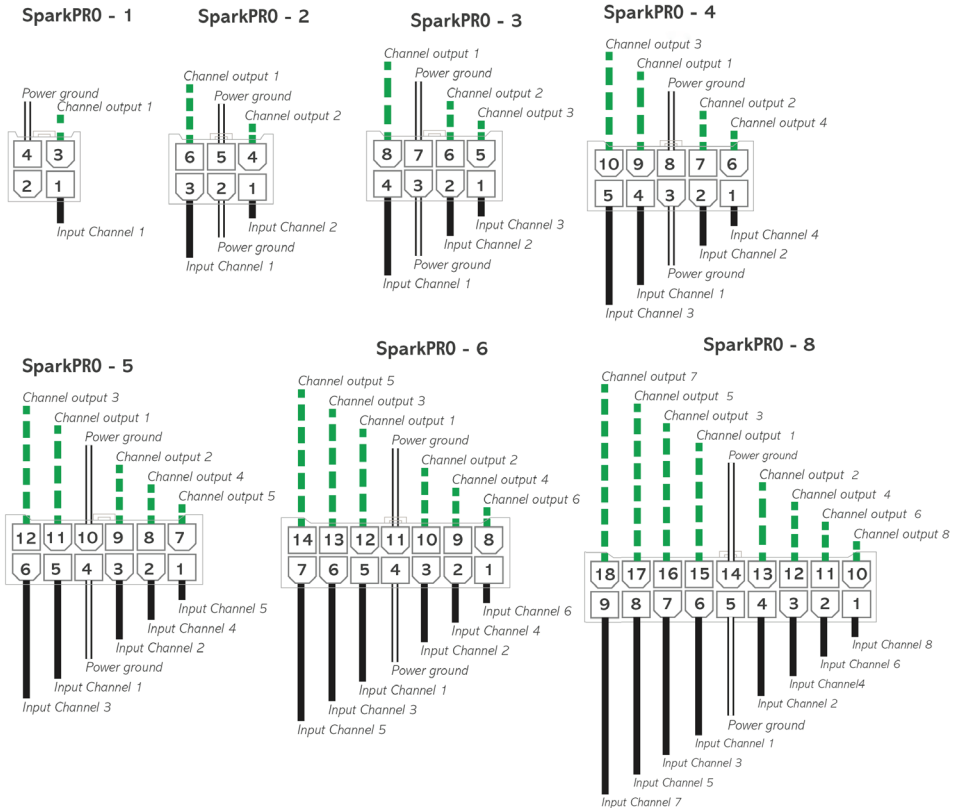
4.4 Wiring example



Wiring diagram of a SparkPRO-1 and a coil with two wires



4.5 Connector's pins



Legend

- - - - - Channel output - Wire 1,0mm²
- Power Ground - Wire 1,0mm²
- Ignition Signal Input - Wire 0,5mm²

5. Configuration of the ignition control module

The SparkPRO module is especially indicated to be used with programmable ignition systems. The synchronism of the ignition signal must be **Falling Edge, Inverted Signal** or **SparkPRO / 3 wires** on FuelTech ignition systems.

The coil charge time (Dwell Time) in systems using only one coil is generally between 2.50ms and 4.00ms. In systems without a distributor, with individual coils or working on wasted spark mode, the Dwell Time is normally between 1.80ms and 5.00ms.

The coil charge time can be technically determined by applying the following instructions: using an oscilloscope, verify the current waveform at the coil's primary and observe how much time is needed for the current to stabilize in a certain value for approximately 0.50ms. Reaching stabilization means the coil is saturated.

When the coil charge time is too short, the coil does not load to its maximum capacity, and as a result, the spark has lower energy. If the coil does not heat up slightly after being used for at least 20 minutes, it normally represents that the charge time is insufficient.

On the contrary, an excessive charge time saturates the ignition coil, causing it and the SparkPRO to overheat. Consequently, the energy of the spark is reduced as a result of the lesser efficiency of both SparkPRO and ignition coil. There is also a great risk of coil and/or SparkPRO being irreparably damaged from an excessive Dwell Time.

The product warranty does not cover damages caused by excessive coil charge time (Dwell), as this parameter is configured by the user. Therefore, be very attentive to the temperatures of the SparkPRO and the coil, especially when operating the system for the first time!

Attention! NEVER configure the Ignition Output as “MSD – Rising Edge”! If done so, the SparkPRO module and/or the ignition coil will be damaged immediately!



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