S8000

PROGRAMMABLE ELETRONIC FUEL INJECTION MODULE

InjePro Automotive Technology

S8000

Installation and Operation Manual

InjePro Automotive Technology

SUMMARY

1 TERMS OF USE

This manual treats about INJEPRO product functions and details. Read it with attention so that you may use all benefits this product can provide.

Its installation implies on our terms of use acceptation and indicates that you assume, by you own responsibility and risk, that these products use do not violate any law or rule in the country it will be used.

You also understand that this software and INJEPRO product, which works in conjunct, is produced only for competition and/or circuit races, and it is not applied to use in public roads.

1 INTRODUCTION

The INJEPRO S8000 module professionally manages engines from 1 to 12 cylinders with full fuel injection and ignition tables, with individual cylinder trim for engines up to 8 cylinders, and a closed loop compensation with full table for a fine adjustment in any load.

It has as integrated Datalogger with more than 34 channels and 2 hours of recording.

The map setup can be made through Tune-Up, INJEPRO Display or a PC with the software, all in real time.

2 INPUTS AND OUTPUTS FUNCTIONS AND APPLICATIONS

2.1 Inputs Settings
The 14 configurable inputs may be configured as:

1- Analogic 0-5V;
2- Pressure (Others);
3- Fuel Pressure;
4- Oil Pressure;
5- EBC Pressure;
6- External MAP;
7- Pedal 1;
8- Pedal 2;
9- TPS 1;
10- TPS 2;
11- Narrow Band O2 Sensor;
12- RPM Reference Voltage;
13- EGS Signal;
14- Engine Temperature;
15- Air Temperature;
16- Burnout;
17- Two-Step;
18- Air Conditioner;
19- Nitro Signal;

20- Booster Signal;

21- Traction Wheel Speed;

22- Free Wheel Speed;

23- Serial RX;

24- Oil Temperature;

25- Fuel Temperature;

26- Temperature (Others);

27- Air Conditioner Pressure Sensor;

28- RPM (Others);

29- Gear Shift Button;

30- Boost +.

P.S.: The Serial RX function may only be configured at white wires 8 and 9, as well as RPM (Others) function, that may only be configured at white wires 2 and 8.

The Software identifies and informs when one of the items is configured more than once, except for Analogic 0-5V, Pressure (Others), and Temperature (Others).

Apart from configurable inputs, there are the fixed inputs, which are:

1- CAN L;
2- CAN H;
3- RPM Sensor Signal;
4- RPM Reference Signal;
5- CAM Sync Sensor 1 Signal;
6- CAM Sync Sensor 2 Signal;
7- Wideband O2 Sensor.

2.2   Outputs Settings

Grey wires 0 – 5V 1A

The 8 grey wires' default settings are for ignition control; however, is possible to set them with the following functions:

1- Ignition Output;
2- Thermatic Fan 1;
3- Thermatic Fan 2;
4- Fuel Pump;
5- Camshaft Control;
6- Camshaft Control PWM 1;
7- Camshaft Control PWM 2;
8- Tachometer;
9- Air Conditioner;
10- Shift-Light;
11- Additional Injector 1 Output;
12- Additional Injector 2 Output;
13- Additional Injector 3 Output;
14- Additional Injector 4 Output;
15- Additional Injector 5 Output;

16-Additional Injector 6 Output;
17-Additional Injector 7 Output;
18-Additional Injector 8 Output;
19-EBC Brake;
20-EBC Parachutes;
21-Gear Shift.

Yellow wires 1 to 4 and 0 – 12V 1A output

By default are used to electronic throttle control or stepper motor, but they are also configured for:

1- Thermatic Fan 1;
2- Thermatic Fan 2;
3- Fuel Pump;
4- Camshaft Control;
5- Camshaft Control PWM 1;
6- Camshaft Control PWM 2;
7- Tachometer;
8- Air Conditioner;
9- Shift-Light;
10-Idle Solenoid;
11-Idle Actuator M1;
12-Idle Actuator M2;
13-Stepper Motor A1;
14-Stepper Motor A2;
15-Stepper Motor B1;
16-Stepper Motor B2;
17-Throttle M1;
18-Throttle M2;
19-Additional Injector 1 Output;
20-Additional Injector 2 Output;
21-Additional Injector 3 Output;
22-Additional Injector 4 Output;
23-Additional Injector 5 Output;
24-Additional Injector 6 Output;
25-Additional Injector 7 Output;
26-Additional Injector 8 Output;
27-EBC Solenoid +;
28-EBC Solenoid −;
29-EBC Break;
30-EBC Parachutes;
31-Gear Shift.

Yellow wire 5

When using a Distributor for ignition, this wire is required. But, if using Crank Trigger

Wheel and Individual Ignition Outputs this wire may be used for:

1- Distributor Ignition;
2- Thermatic Fan 1;
3- Thermatic Fan 2;

4- Fuel Pump;
5- Camshaft Control;
6- Tachometer;
7- Air Conditioner;
8- Shift-Light;
9- Idle Solenoid;
10- Additional Injector Output 1;
11- Additional Injector Output 2;
12- Additional Injector Output 3;
13- Additional Injector Output 4;
14- Additional Injector Output 5;
15- Additional Injector Output 6;
16- Additional Injector Output 7;
17- Additional Injector Output 8;
18- EBC Brake;
19- EBC Parachutes;
20- Gear Shift.

Blue Negative wires 5A

The blue wires are default for fuel injectors. For having negative signs they cannot be used for electronic throttle or idling actuators. However, is possible to set them with the following functions:

1- Thermatic Fan 1;
2- Thermatic Fan 2;
3- Fuel Pump;
4- Camshaft Control;
5- Camshaft Control PWM 1;
6- Camshaft Control PWM 2;
7- Tachometer;
8- Booster;
9- Air Conditioner;
10- Shift-Light;
11- Idle Solenoid;
12- Injector 1 Output;
13- Injector 2 Output;
14- Injector 3 Output;
15- Injector 4 Output;
16- Injector 5 Output;
17- Injector 6 Output;
18- Injector 7 Output;
19- Injector 8 Output;
20- Additional Injector 1 Output;
21- Additional Injector 2 Output;
22- Additional Injector 3 Output;
23- Additional Injector 4 Output;
24- Additional Injector 5 Output;
25- Additional Injector 6 Output;
26- Additional Injector 7 Output;
27- Additional Injector 8 Output;

28-Booster Solenoid +;

29-Booster Solenoid −;

30-Booster Break;

31-Booster Parachutes;

32-Nitro PWM;

33-Gear Shift.

- USB for software communication, Tune-Up or INJEPRO Display;
- CAN for Tune-Up communication, AIM panel and others INJEPRO modules;
- 1 serial channel for WB-METER communications;
- 7 BAR integrated MAP Sensor, where 1 BAR is intended with engine's aspirated phase and 6 BAR for turbocharged engines.

3   FUNCTIONS

- Sequential fuel injection for engines up to 8 cylinders and semi-sequential up to 12 cylinders or Multipoint;
- Four different tables configurable by injector output (Banks A, B, C, and D);
- Sequential ignition for engines up to 8 cylinders and wasted spark up to 12 cylinders;
- Full table of fuel injection and ignition timing with 1300 definition points (Table 50x26);
- Two (2) full tables for PWM controls with 1300 definition points (Table 50x26) being able to set a camshaft control (VTI), progressive nitro, etc.
- Full table of closed loop compensation with 1300 of definition points (Table 50x26);
- MAP or TPS Fuel Injection Table;
- MAP or TPS Ignition Table;
- Fuel Injection by Temperature Table specific for engine start;
- Fuel injection compensation by engine temperature with adjustable axis of 11 points;
- Fuel injection compensation by air temperature with adjustable axis of 11 points;
- Fuel injection compensation by battery voltage;
- Fuel injection compensation by TPS with adjustable axis of 11 points;
- Fuel injection compensation by MAP with adjustable axis of 26 points;
- Fuel injection compensation by RPM;
- Fuel injection angle by RPM table with 50 definition points.
- Overall trim of fuel injection;
- Fuel injection individual cylinder trim by RPM with adjustable axis of 50 points;
- Acceleration Fuel Enrichment;
- Post start fuel injection compensation;
- Full ignition timing table with 1300 definition points (table 50x26);
- Ignition timing by Temperature Table specific for engine start;
- Ignition timing compensation by engine temperature with adjustable axis of 11 points;
- Ignition timing compensation by air temperature with adjustable axis of 11 points;
- Ignition Timing Idle Table;

- Ignition Timing compensation by MAP with adjustable axis of 50 points;
- Ignition Timing compensation by TPS with adjustable axis of 11 points;
- Overall trim of ignition timing;
- Ignition timing individual cylinder trim by RPM with adjustable axis of 50 points;
- Thermatic Fan Control by engine temperature with two speeds and fuel enrichment;
- Timed fuel pump control;
- Camshaft Control (VTEC);
- Booster Control with 3 stages with activation by button, time or RPM;
- Air Conditioner Clutch Control;
- Burnout control with fuel enrichment, ignition timing, minimum RPM and TPS for activation, and rev limiter proper for this function;
- Two-Step control with fuel enrichment, ignition timing, minimum RPM and TPS for activation, and traction control by RPM and time;
- Deceleration Cutoff;
- Rev Limiter by ignition, fuel, or ignition and fuel cuts;
- Active control of engine torque by time, slip, RPM variation, or gear shifting;
- Full table for Nitro PWM control, where is possible to work a progressive nitro by RPM and by TPS/MAP, with addition of fuel injection compensation by RPM and by Nitro PWM percentage. It is possible to configure the Activation Mode, Minimum Fuel Pressure, Minimum Engine Temperature, percentage of nitro during Two Step, Delay after Two Step, ignition timing compensation, and frequency of the solenoid;
- Sound and visual alerts with "just warn", "safe mode" and "turn engine off" actions for:

1- RPM excess to over Rev;
2- Excess pressure to overboost;
3- Engine temperature;
4- Injector duty cycle;
5- Low fuel pressure;
6- Low oil pressure;
7- CAM Sync Signal Failure.

- Anti-Lag for Turbo;
- Output to Shift-Light;
- Fixed, normal or automatic Stepper Motor control;
- Idle control through ignition timing, with activation of the solenoid by temperature, activation of the air conditioner, and for a determined time after the start;
- Fuel enrichment when air conditioner is on;
- Turn air conditioner off when TPS reaches determined value;
- Integrated EBC (Electronic Booster Control);
- Integrated EGS (Electronic Gear Shift);
- Closed loop compensation per Cylinder.

4   MODULE DIMENSIONS: 141 MM X 10MM X 40MM

14 cm
17,5 cm

3,5 cm

18,2 cm
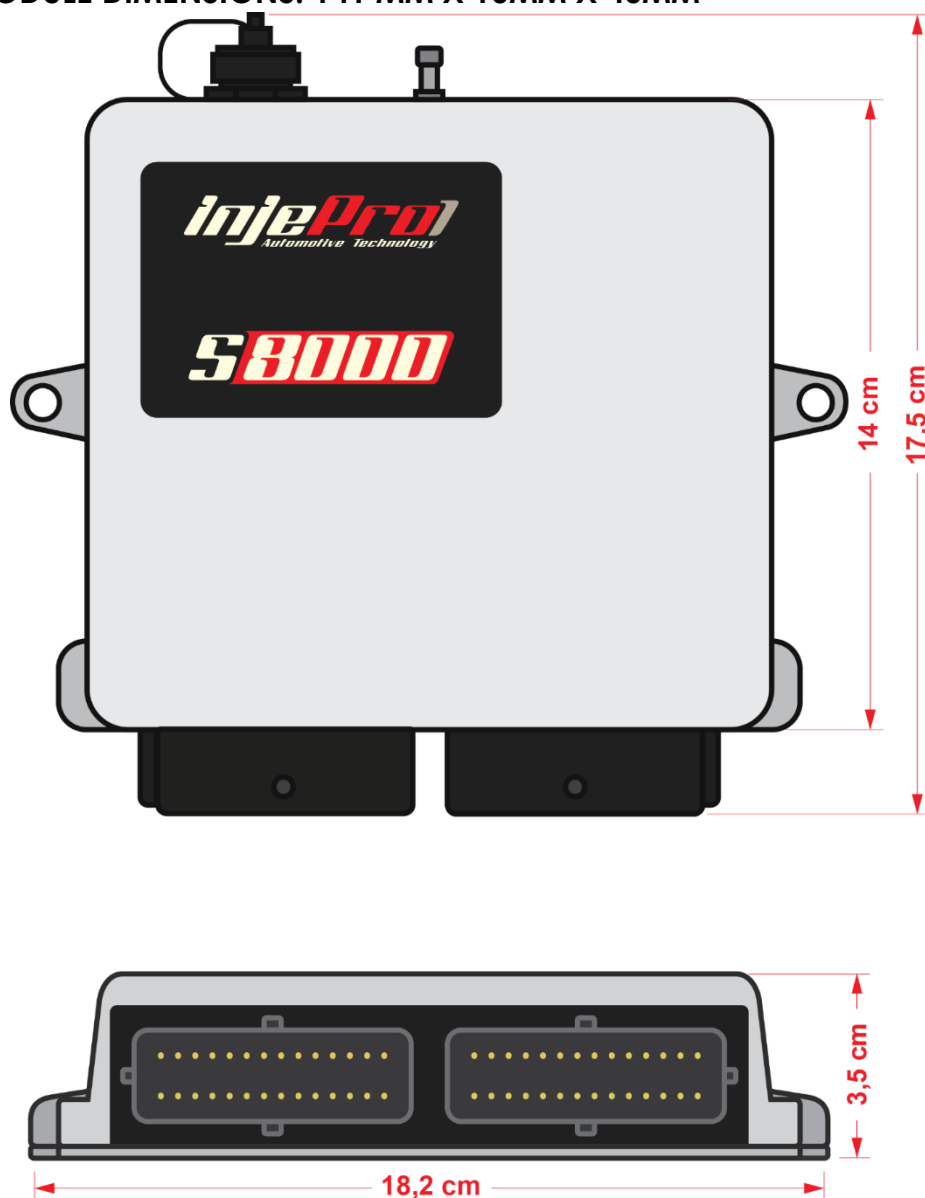
Module Dimension

5   TIPS BEFORE INSTALLATION

1- Choose a good location to accommodate the INJEPRO S8000, preferably inside the vehicle, preventing moisture, excessive heat and dirt;
2- Never pass the harness next to the ignition cables, coils, alternator, speaker, and sources that can cause electrical noise;
3- Always put protection for electric harness, as corrugated cover;
4- All the wires should be welded and sealed with heat shrink sleeves;
5- Make sure the engine ground cable is well connected and free from poor contact;
6- Use good quality sensors and components for proper operation of INJEPRO S8000;
7- Use only the vehicle's original resistive spark plugs and spark plug wires;

8- The electric harness must have special attention, because it is a major cause of problems in the operation of the engine.

9- The wires must be cut and have their tips isolated to reduce the possibilities of electromagnetic interferences. **Always use resistive and high quality spark plugs and spark plugs wires. The non-use of resistive spark plugs and spark plugs wires may cause serious interferences on INJEPRO module, as ignition cut and loss of maps.**

10- For the correct operation of INJEPRO module, and avoiding module damages, in starting procedure is necessary that the voltage supplied to the module do not be less than 10 volts. Therefore, never try to crank a vehicle with low battery.

11- When proceeding with the TPS sensor connections, avoid the contact between the green wire (5V) and the black wire (ground). It may cause several damages to INJEPRO module when turning it on, or if there is involuntary current in system during installation procedure.

6 ELECTRICAL CONNECTIONS

6.1 Rear view of the S8000 harness connector 56 ways

(Orange O2 sensor cable) Pin 3 O2 sensor

(Brown O2 Sensor) Pin 1 O2 Sensor

(Green O2 Sensor) Pin 2 O2 Sensor

(White 2) Configurable Signal Input

(White 4) Configurable Signal Input

(White 6) Configurable Signal Input

(White 8) Configurable Signal Input

(White 10) Configurable Signal Input

(White 12) Configurable Signal Input

(White 13) Configurable Signal Input

(White 14) Configurable Signal Input

(White/Lilac) CAM Sync 2

(Green) 5V TPS Sensors

(Red) Positive Switched

(Red) Positive Switched

(Yellow 3) Output 2A/12V

(Yellow 1) Output 2A/12V

(Grey 11) Output 1A

(Yellow 5) Ignition Distrib/Output 1A/12V

(Grey 8) Ignition Output 1A

(Grey 6) Ignition Output 1A

(Grey 4) Ignition Output 1A

(Grey 2) Ignition Output 1A

(Blue 8) Injector/Output 5A

(Blue 6) Injector/Output 5A

(Blue 4) Injector/Output 5A

(Blue 2) Injector/Output 5A

(Black) Power Ground

Unicolor Wire

Bicolor Wire

Mesh wire

(Black and White) Signal Ground

(Red O2 Sensor cable) RPM Reference

(White O2 Sensor Cable) RPM

(White/Red) CAM Sync

(White) CAN H

(Light Blue) CAN L

(White 11) Configurable Signal Input

(White 9) Configurable Signal Input

(White 7) Configurable Signal Input

(White 5) Configurable Signal Input

(White 3) Configurable Signal Input

(White 1) Configurable Signal Input

(Yellow O2 sensor cable) Pin 5 O2 sensor

(Red O2 sensor cable) Pin 6 O2 sensor

(Blue 1) Injector/Output 5A

(Blue 3) Injector/Output 5A

(Blue 5) Injector/Output 5A

(Blue 7) Injector/Output 5A

(Black) Power Ground

(Grey 1) Ignition Output 1A

(Grey 3) Ignition Output 1A

(Grey 5) Ignition Output 1A

(Grey 7) Ignition Output 1A

(Grey 9) Ignition Output 1A

(Grey 10) Ignition Output 1A

(Yellow 2) Output 2A/12V

(Yellow 4) Output 2A/12V

(Black) Power Ground

Electrical Connections

6.2 Table of default settings of inputs and outputs of the S8000

PIN	WIRE COLOR	DIAMETER (mm)	FUNCTION
1	BLUE 1	0.75	INJECTOR/OUTPUT 5A
2	BLUE 3	0.75	INJECTOR/OUTPUT 5A
3	BLUE 5	0.75	INJECTOR/OUTPUT 5A
4	BLUE 7	0.75	INJECTOR/OUTPUT 5A
5	BLACK	1.00	POWER GROUND
6	GREY 1	0.50	IGNITION/OUTPUT 1A
7	GREY 3	0.50	IGNITION/OUTPUT 1A
8	GREY 5	0.50	IGNITION/OUTPUT 1A
9	GREY 7	0.50	IGNITION/OUTPUT 1A
10	GREY 9	0.50	OUTPUT 1A
11	GREY 10	0.50	OUTPUT 1A
12	YELLOW 2	0.75	OUTPUT 2A/12V
13	YELLOW 4	0.75	OUTPUT 2A/12V
14	BLACK	1.00	POWER GROUND
15	RED – O2 SENSOR CABLE	0.50	PIN 6 O2 SENSOR
16	YELLOW – O2 SENSOR CABLE	0.50	PIN 5 O2 SENSOR
17	WHITE 1	0.50	CONFIGURABLE INPUT
18	WHITE 3	0.50	CONFIGURABLE INPUT
19	WHITE 5	0.50	CONFIGURABLE INPUT
20	WHITE 7	0.50	CONFIGURABLE INPUT
21	WHITE 9	0.50	CONFIGURABLE INPUT
22	WHITE 11	0.50	CONFIGURABLE INPUT
23	LIGHT BLUE	0.50	CAN L
24	BRANCO	0.50	CAN H

25	WHITE/RED	0.50	CAM SYNC
26	WHITE – MESH CABLE	0.50	RPM
27	RED – MESH CABLE	0.50	REFERENCE RPM
28	BLACK/WHITE	1.00	SIGNAL GROUND
29	BLACK	1.00	POWER GROUND
30	BLUE 2	0.75	INJECTOR/OUTPUT 5A
31	BLUE 4	0.75	INJECTOR/OUTPUT 5A
32	BLUE 6	0.75	INJECTOR/OUTPUT 5A
33	BLUE 8	0.75	INJECTOR/OUTPUT 5A
34	GREY 2	0.50	IGNITION/OUTPUT 1A
35	GREY 4	0.50	IGNITION/OUTPUT 1A
36	GREY 6	0.50	IGNITION/OUTPUT 1A
37	GREY 8	0.50	IGNITION/OUTPUT 1A
38	YELLOW 5	0.50	IGNITION DISTRIB/OUTPUT 1A/12V
39	GREY 11	0.50	OUTPUT 1A
40	YELLOW 1	0.75	OUTPUT 2A/12V
41	YELLOW 3	0.75	OUTPUT 2A/12V
42	RED	1.00	SWITCHED 12V
43	ORANGE –O2 SENSOR CABLE	0.50	PIN 3 O2 SENSOR
44	BROWN – O2 SENSOR CABLE	0.50	PIN 1 O2 SENSOR
45	GREEN – O2 SENSOR CABLE	0.50	PIN 2 O2 SENSOR
46	WHITE 2	0.50	CONFIGURABLE INPUT
47	WHITE 4	0.50	CONFIGURABLE INPUT
48	WHITE 6	0.50	CONFIGURABLE INPUT
49	WHITE 8	0.50	CONFIGURABLE INPUT

50	WHITE 10	0.50	CONFIGURABLE INPUT
51	WHITE 12	0.50	CONFIGURABLE INPUT
52	WHITE 13	0.50	CONFIGURABLE INPUT
53	WHITE 14	0.50	CONFIGURABLE INPUT
54	WHITE/LILAC	0.50	CAM SYNC 2
55	GREEN	0.50	5V TO FEED TPS/SENSORS
56	RED	1.00	SWITCHED 12V

The INJEPRO S8000 module supply is done through 6 wires, being 2 switched 12V, 3 power ground and 1 signal ground.

6.3   Red Wire – Switched 12V

Pin 42 and 56 (red wire) are responsible for the module's supply. Install a power relay (minimum 30A) to this connection, with the positive that feeds the pin 30 coming directly from the battery positive terminal. Do not share this relay output with actuators such as injectors, coils, solenoids, etc. This same relay can only be connected to sensors that use 12V supply and other modules such as WB-METER and PEAK & HOLD.

6.4   Thick black wire – Power Ground

The pins 5, 14 and 29 (black wire) must be connected directly to the chassis or in the engine block. Avoid connecting the power ground to the battery ground, they should be separated and connected to the chassis or in the engine block. It is very important that this power ground have a good electrical contact to the block. With them can be connected the ground wire of the coils that have integrated module, ground wires of the ISD and PEAK & HOLD modules, O_2 sensor heating, and relays grounds.

6.5   Thin black wire – Signal Ground

The pin 28 (black/white pin) is a signal ground and must be connected directly to the battery negative pole. With it can be connected the negative of the sensors, such as the engine temperature, air temperature, TPS, pressure sensors, negative signal of the O_2 sensor, etc. Avoid connecting this signal ground in the chassis or in the engine block.

6.6   Master Key

For racing cars or others that use master key, it is very important that the key turn off the positive of the battery and NEVER the ground. Any electronic equipment should have its supply stopped through the positive, because the shutdown done by the ground can bring irreparable damage to the equipment, or even failures/interferences when operating. The ground of the battery must be directly connected to the chassis through a common braided mesh, easily found in auto electric shops; this braided mesh helps to get rid of noises that may cause interferences in the electronic equipment. Below, there is the picture of how central power wires must be connected together with the master key.
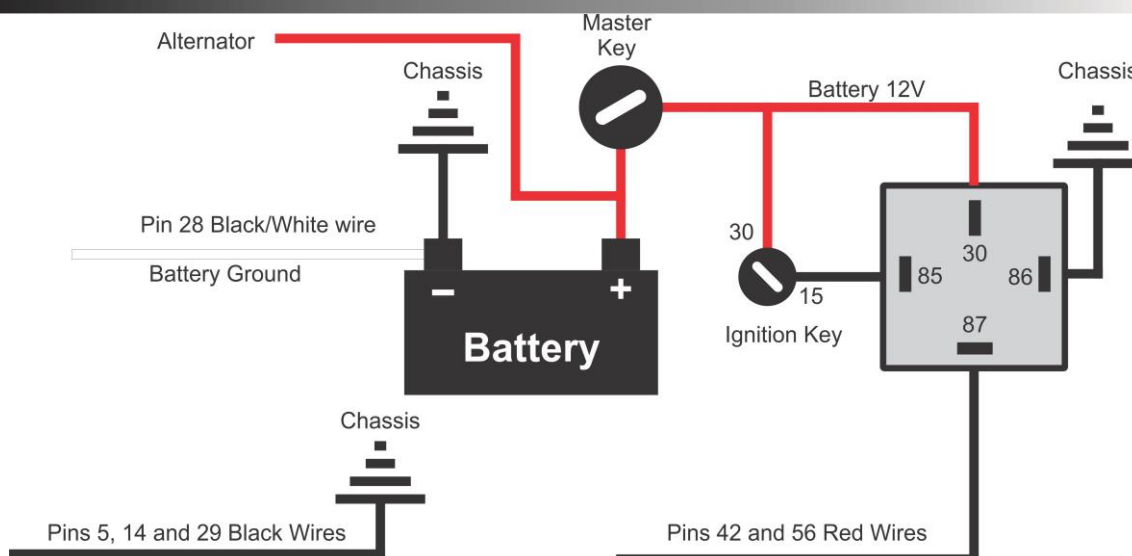
Master Key Connections

7 INSTALLATION AND ADJUSTMENTS WHEN USING CRANK TRIGGER WHEEL OR DISTRIBUTOR

7.1 RPM Sensor

This is the main sensor to the engine operation. It informs the angular position of the crankshaft so that the S8000 calculate the ignition and fuel injection parameters and apply in the engine precisely the values defined in the map.

There are RPM sensors of the type inductive or hall.
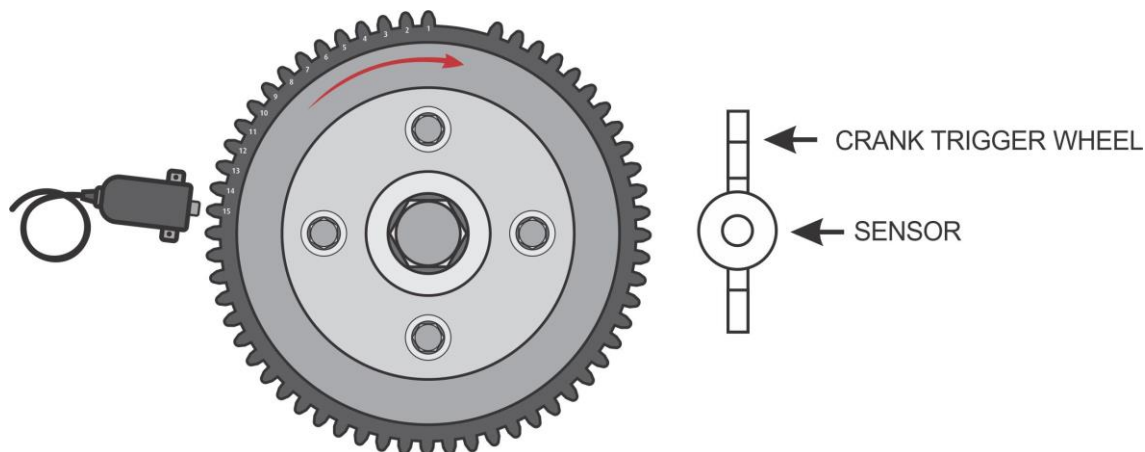
7.2 Inductive Sensor

The inductive sensors generate a sinusoidal wave signal that varies according to the engine RPM. The signal intensity also varies according to the installation distance of the sensor to the teeth of the crank trigger wheel, because of this in some cases it will be necessary to approximate or ward the sensor when appearing signal read failure in the starting or in high RPM. It is also possible to work on the RPM sensor signal edge (rising edge or falling edge). The majority inductive sensors with crank trigger wheel are falling edge aligned. Besides this configuration is possible to work on sensor sensibility, where level 1 is the lowest and level 4 is the highest. This sensibility level is related to the missing teeth count, more missing teeth less

sensibility. It is also possible to configure sensor reference voltage; it enables to share the RPM signal with the car's original module, where can be measure the reference voltage used on RPM sensor and adjust the signal reading voltage. We have a reference voltage for low RPM and another for high RPM, in a way that the reading do not have failures in any RPM range. The reference voltage is interpolated from the crank RPM (400 RPM) up to the "Maximum RPM" set in the "Injection Setup". For a direct connection between sensor and S8000 a 0.3V reference for low RPM and 0.8V for high RPM is indicated.

Engine Type	Piston	
Crank Trigger Wheel Teeth	60	
Crank Trigger Wheel Missing Teeth	2	
Sensor Alignment	20	teeth from TDC
First Teeth Alignment	0.0	°
Size of the HALL Window	72.0	°
Distributor Initial Advance	10.0	°
RPM Sensor	Inductive	
RPM Sensor Signal Edge	Falling	
Sensibility	Level 1	
Reference Voltage (Low RPM)	0.3	V
Reference Voltage (High RPM)	0.8	V

Inductive Sensor Software Configuration

This kind of sensor is found in the most of original cars with crank trigger wheels 60-2 and 36-1, and it can be of 2 or 3 wires. If the sensor is 2 wires, connect the red wire of the shielded cable to the pin 1 and the white wire of the shielded cable to the pin 2, if do not receive RPM signal, invert the red wire to the white one. When the sensor is inductive and 3 wires, 2 of its pins will be enough to its operation, the third pin is the isolation mesh. You can find out the sensor connection with the help of a multimeter. Set it to measure resistance in 20K scale and apply one end in the middle pin and the other in the sideward pin. The pin which mark resistance with the middle pin will be connected the red wire, and the other sideward pin will be connected the white wire (signal). In the remaining pin, connect the battery ground or the shielded cable insulation mesh. If the sensor has three wires and not display any resistance between pins, it might be burnt or it might be "hall type".

7.3   Hall Sensor

The "hall type" sensors generate a wave of square sign according to the size of the crank trigger wheel tooth and its intensity does not vary with the engine RPM. This kind of sensor is indicated in crank trigger wheels with few teeth or when the wheel diameter is too small. They mandatorily have 3 wires and they need an external supply, so a pin will be the positive 5 or 12 volts, the other battery ground and the third pin the signal.

To find out the connection of the "hall", put the multimeter to measure diode and apply the tips in all possible positions, when you find a position in which the multimeter mark around 0.7V, the pin of the red tip will be the battery ground and the pin of the black tip will be the signal, the third pin will receive 5V or 12V supply.

In the Hall Sensor's configuration is used a 1.5V reference voltage for low and high RPM.

7.4   Distribuidor

Aiming a better performance and operation, INJEPRO recommends for engines with 4 or more cylinders, when distributor, the following orientations:

1- Put the engine in TDC (Top Dead Center);
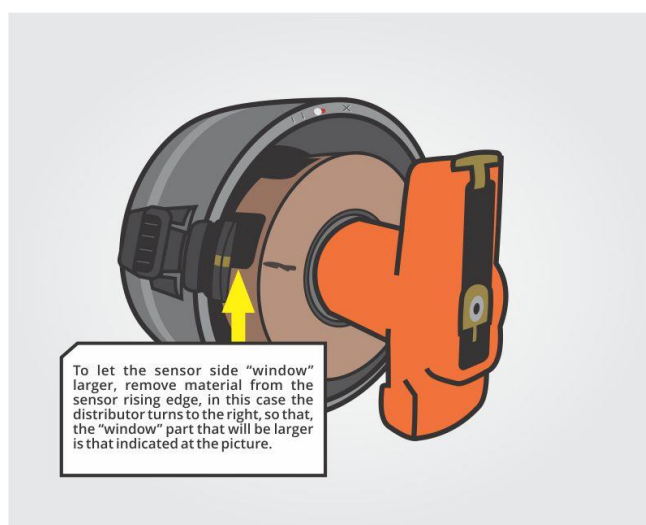2- Check which connector is responsible for sending current to cylinder 1;
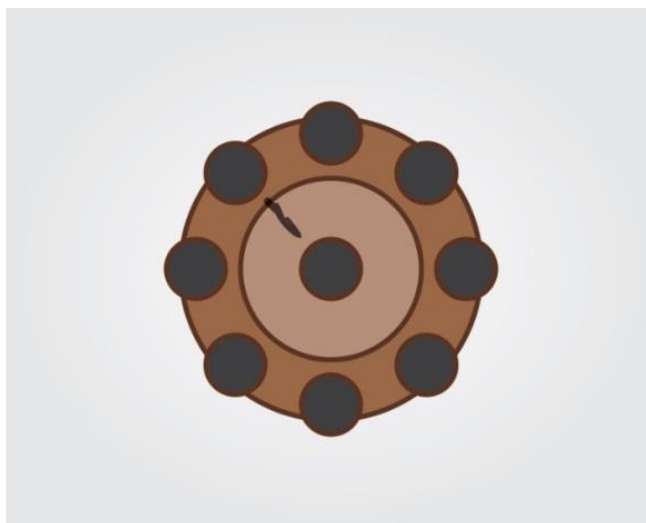
3- Mark this connector and the distributor frame;

4- Dismantle the distributor and develop a mobile table in relation to the distributor axis, then will be possible the ignition timing ideal adjustment without changing distributor position and rotor position in relation to the distributor cover;
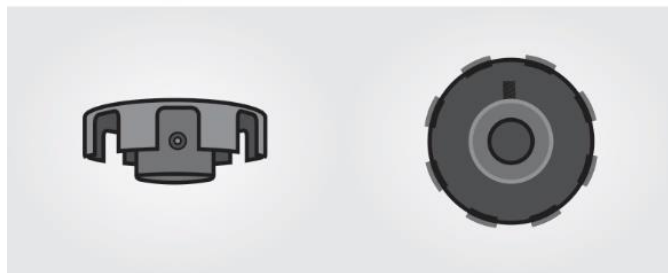
5- The alignment between the table and the sensor is very important, the set is responsible for the ignition timing and for the fuel injection at the right moment, therefore, is needed that this "window" be in average 1mm larger in one of the sides, so that the module has the cylinder 1 TDC reference (choose the sensor side to remove material);

To let the sensor side "window" larger, remove material from the sensor rising edge, in this case the distributor turns to the right, so that, the "window" part that will be larger is that indicated at the picture.

6- Taking into account that this distributor turns to the right, is important to leave the pieces previously adjusted so that the rotor stay pointed 5mm forward in relation to the TDC mark as in the picture. This adjustment is important because when the engine is in fast RPM, usually, the module ignition timing map is advanced, so that, in the moment that the module fires spark the rotor will be positioned behind TDC, in case it is not done that way the possibility of a spark to "jump" to the anterior cylinder is big, since this cylinder has not compression and the spark tends to seek the "easiest" way;

7- After all adjusted and fixed, mount the distributor at the engine.

7.5 Table of the connection of the most used RPM sensors

Sensor	Aplication	Type	SFI-PRO 6 Shielded Cable Connection
FIAT/Magneti Marelli 3 wires	**Uno, Palio, Siena 1.0, Strada**	**Inductive**	**Pin 1: White Wire** **Pin 2: Red Wire** **Pin 3: Armored Mesh cape**
GM/VW/FIAT Bosch 3 wires	**Astra, Calibra, Corsa 8V MPFI, Golf, Marea 5 cylinders, Omega 2.0, 2.2 e 4.1, S10 2.2, Silverado 4.1, Vectra, Passat**	**Inductive**	**Pin 1: White Wire** **Pin 2: Red Wire** **Pin 3: Armored Mesh cape**
VW/Audi 20V Bosch 3 wires	**A3 1.8 20V, Bora 2.0, Golf 1.6, Golf 1.8 20V**	**Inductive**	**Pin 1: Armored Mesh cape** **Pin 2: White Wire** **Pin 3: Red Wire**
Ford 2 wires	**Ka, Fiesta, Focus Zetec, Ranger V6**	**Inductive**	**Pin 1: Red Wire** **Pin 2: White Wire**
Siemens 2 wires	**Clio, Megane, Scenic**	**Inductive**	**Pin 1: Red Wire** **Pin 2: White Wire**
VW/Total Flex	**AP Power/Flex, GTI 16V**	**Hall**	**Pin 1: 5 or 12 Volts** **Pin 2: White Wire** **Pin 3: Armored Mesh cape**
FIAT/E-Torq 1.8 16V	**Bravo, Strada, Palio Sporting**	**Hall**	**Pin 1: Armored Mesh cape** **Pin 2: White Wire** **Pin 3: 5 or 12 Volts**

Denso	Honda Civic Si	Hall	Pin 1: 5 or 12 Volts
			Pin 2: Armored Mesh cape
			Pin 3: White Wire

7.6   Cam Sync Sensor

This sensor informs to S8000 the TDC of cylinder 1(moment in which the cylinder 1 is exploding) for synchronism of the triggering of ignition and injection outputs. The use of the cam sync sensor is required when using the ignition or fuel injection in sequential mode. With this sensor installed, it is also possible to do individuals fuel and ignition compensations by cylinder, even using the semi-sequential fuel injection mode or wasted spark ignition with a double coil, for example. The installation of the cam sync sensor must be done in the camshaft or it must be adapted in the distributor where the complete turn is done with two turns of the crankshaft. The position of the sensor in relation to the crank trigger wheel can be configured in two ways: if the cam sync is positioned on cylinder 1 explosion lap, it must be configured as 0 to 360 degrees at the menu, in case it is at the next lap, configure as 361 to 720 degrees.

CAM Sync Sensor Position

Ending of the tooth or window — CAM Sync Sensor

Synchronism Tooth of CAM Syn or Window

Beginning of Tooth or Window
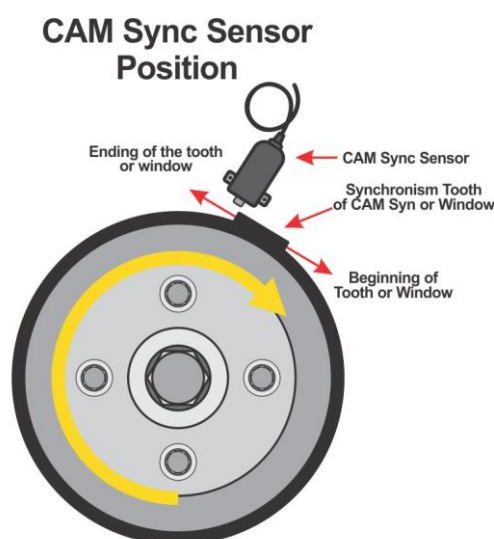
RUEDA CON UN DIENTE O UNA VENTANA

Cam Sync Sensor	Hall
Cam Sync Edge	Rising
Cam Sync Position	From 1 to 360

7.7 Table of Cam Sync Sensors Connection

Sensor		Aplication	Type	Connector Connection
Audi/VW wires	3	**All Audi/VW 1.8 20V**	**Hall**	**Pin 1: 5 Volts** **Pin 2: White/Red Wire** **Pin 3: Battery Ground**
Bosch wires	3	**Astra 16V, Calibra, Citroen 2.0, Marea 5 cylinders Omega 4.1, Peugeot 306 2.0 16V, Vectra GSI**	**Hall**	**Pin 1: 5 Volts** **Pin 2: White/Red Wire** **Pin 3: Battery Ground**
Ford wires	2	**Ka, Fiesta, Focus Zetec, Ranger V6**	**Inductive**	**Pin 1: White/Red Wire** **Pin 2: Battery Ground**
FIAT/E-Torq 16V	1.8	**Bravo, Strada, Palio Sporting**	**Hall**	**Pin 1: Battery Ground** **Pin 2: White/Red Wire** **Pin 3: 5 Volts**
Denso		**Honda Civic Si**	**Hall**	**Pin 1: 5 Volts** **Pin 2: Battery Ground** **Pin 3: White/ Red Wire**

7.8 Engine Temperature Sensor

This sensor informs to S8000 the engine temperature, it is extremely important in order that the ignition and fuel injection compensations occur in all engine temperature ranges, specially the range cold, it is important for engine starting adjustments cold/hot. The installation of the sensor must be made in the water outlet from head to the radiator, preferably in the original sensor location in injection cars, or panel temperature in older cars, and in air-cooled engines or that do not use water, it must be installed in the engine oil.

We recommend the sensors Fiat/VW line. (3.3 ohms in 20 degrees)

Code: VW /FIAT: 026.906.161.12 – MTE: 4053- IG: 802

White 1 to 14

Battery Ground
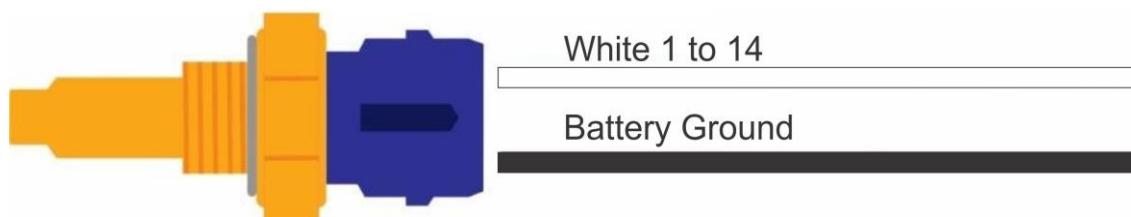
It is also possible to use other sensors besides the Fiat one. In this case it is possible configure which sensor is being used in the "Input/Output Setup" in the input chosen as "Engine Temperature". The Volkswagen and the GM ones are already preprogrammed. If using another choose the option "Custom Temp. Sensor" and in the window that appears (figure below) fill in the conversion table for this sensor. Usually you can find this table in the sensor datasheet.
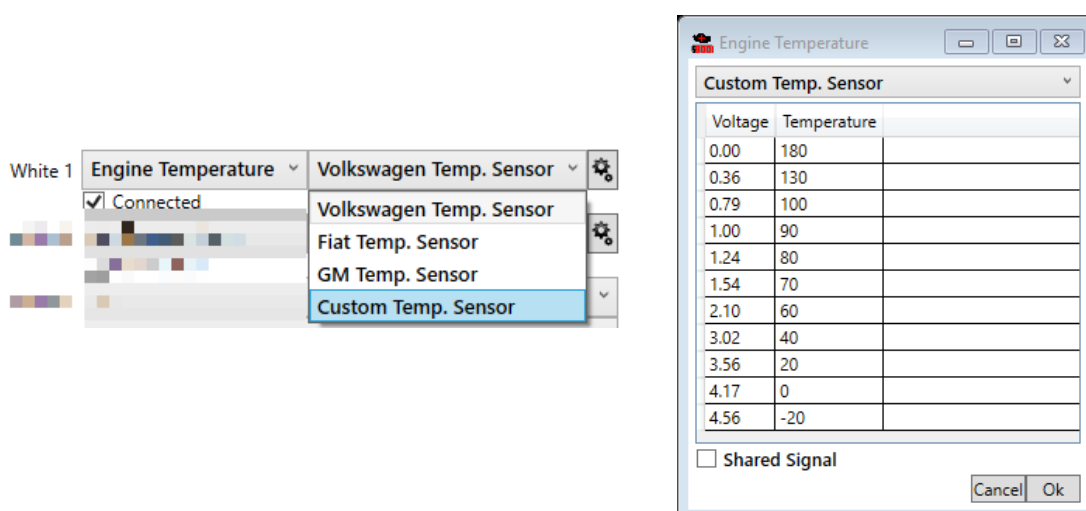
At the bottom of this window you can see a "Shared Signal" checkbox. Check it in the case of sharing the signal with the car's original module.

7.9   Air Temperature Sensor

This sensor informs to S8000 the air temperature, its use is optional and it is used in order to the fuel injection and ignition compensations occur according to the air temperature. This sensor installation must be done in the intake manifold in turbo engines or near the filter inlet or in throttle body in aspirated engines.

We recommend the line sensor Fiat (3.3 ohms in 20 degrees)

Code: FIAT 75 .479.76 - MTE: 5053 – IG: 901
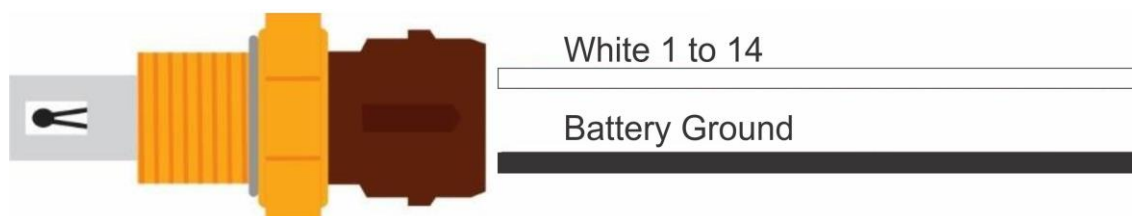
The same way as the engine temperature sensor, it is also possible to use an air temperature sensor of other lines. For this follow the same steps described at the "Engine Temperature Sensor".

7.10   Throttle Position Sensor (TPS)

This sensor informs to S8000 the throttle position in relation to the pedal, its use is extremely important when the main fuel injection table is "Aspirated by TPS". In configurations where the main fuel injection table is by MAP, its use becomes optional, being used only for idle compensations, deceleration cutoff, etc. We recommend the use of the original sensor that accompanies the throttle body because of its fixation and the appropriate course of TBI model, in cases of adaptation it is recommended to use the model that best fits the throttle shaft. When screwing the sensor, ideally, while in low gear (TPS 0%) a charge should remain in the sensor's course, and when speeding (TPS 100%) the sensor must not hit the final barrier. This initial charge is used in order to avoid variations in sensor reading in the initial course of the pedal (idling) and the end clearance to avoid damage to the sensor.

The S8000 accepts any model of linear analogic TPS sensor. All the sensors models have 3 wires (Supply 5 volts, Signal and Ground), the sensor connection must be done according with the producer specifications. The right connection and calibration enables user to define where is the idling (TPS 0%) and full acceleration (TPS 100%). However, if producer specifications are not available we will help you to find out. In order to discover this connection, let the TPS harness disconnected, set the multimeter to measure the resistance in scale 20K and search for 2 pins of the sensor in which from idle to maximum acceleration, the resistance do not vary, these pins will be the sensor supply (positive and negative), after that measure the resistance between the left pin and those from the supply , one at a time, the pin which presents greater resistance in the idling will be the supply positive, and the third left pin will be the signal. After all connected, put the multimeter to measure voltage 20V, apply the red tip in orange wire and the black tip to the negative , in idling it will mark from 0.80V to 1.20V and total acceleration from 3.80V to 4.20V.

TPS	White 1 to 14
	Positive 5 Volts
	Battery Ground
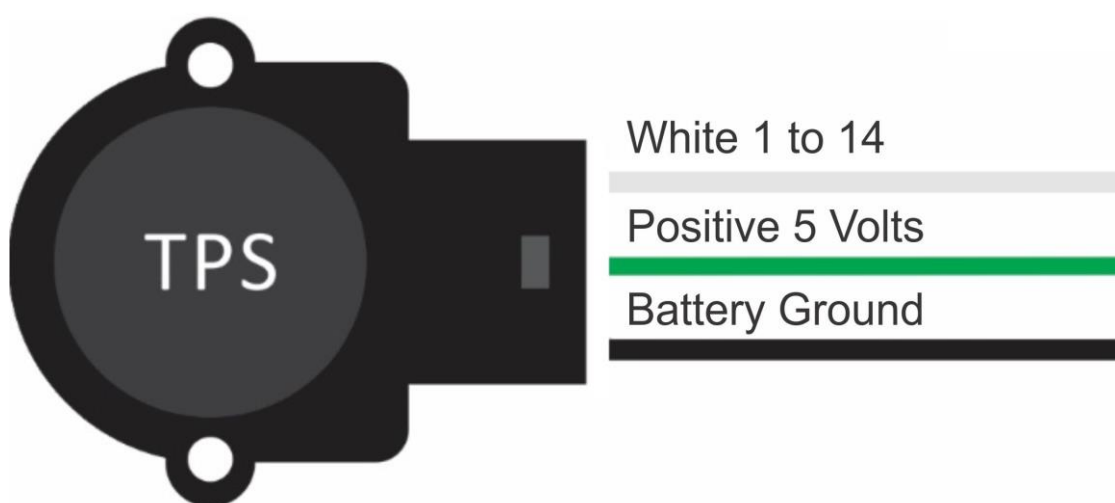
7.11 Narrowband O2 Sensor

This sensor informs to S8000 the Air/Fuel ratio resulting from the burning of gases in the exhaust, the signal of this kind of sensor is in millivolts and it can be directly connected in S8000 using one of the 14 configurable inputs. It is extremely important to the map setup and the fuel compensations, and once set the best setup, the user can enable the closed loop compensation and set the value in millivolts in table to S8000 search the best setup in any condition of Load X RPM. We indicate the use of the planar sensor used in the originals Flex cars.

This sensor can be calibrated. Read the section NARROW BAND O2 SENSOR CALIBRATION for more information.

Code:

Bosh: 0258010011 – NTK code: OZA532-V1 - VW code: 03090626Rz

White Wire (Heating Positive)	Chassis or block ground
White Wire (Heating Ground)	Switching 12V (Relay)
Grey Wire (Signal Ground)	Battery ground
Black Wire (Signal)	White Conf. 1 to 14

7.12 Wideband O2 Sensor

This sensor informs to INJEPRO the Air/Fuel ratio resulting from the burning gases in the exhaust, to manage the wideband it is necessary the use of the external conditioner WB-METER, which is already integrated at S8000. Besides integrated WB, is possible to receive other external WB information, it will inform to S8000 the lambda value concerning the mixture, and its digital output must be connected to the white wire 8 or 9 (that must be configured as "Serial RX").

It is also possible to connect more WB-METER's through CAN network. For this, instead of the connecting the digital output in one of the white wires of the S8000, you connect the CAN wires of the WB-METER (Blue and White wires) in the CAN wires of the S8000 (same colors). All of the WB-METER's that will be using CAN are connected to these same wires. But each of the CAN devices must have a unique ID. The ID a WB-METER appears for some seconds when you power it on. Read the section CAN DEVICES ID SETUP for information on how to do this.

This sensor is extremely important to the map setup and the fuel compensations. Once the best setup is found, the user can enable the closed loop compensation and set the values in lambda in table to S8000 search the best setup in any condition of Load X RPM.

In advanced scenarios, using more than one WB sensor, it is possible to configure a closed loop compensation per fuel injection output. This way the S8000 can calculate different compensations for each output, compensating any mechanical differences between the cylinders. For this advanced configuration access in the software the "Closed Loop Compensation" tab, choose the "Wide Band" O2 Sensor and click in the "Advanced Settings" button. With this the window shown in the figure below will open, allowing you to configure which sensor will be used as base for the compensation of each output. This window also allows to configure the gains of PID control that calculates the percentage of compensation, but this is intended for advanced users, so we recommend to leave the default values.
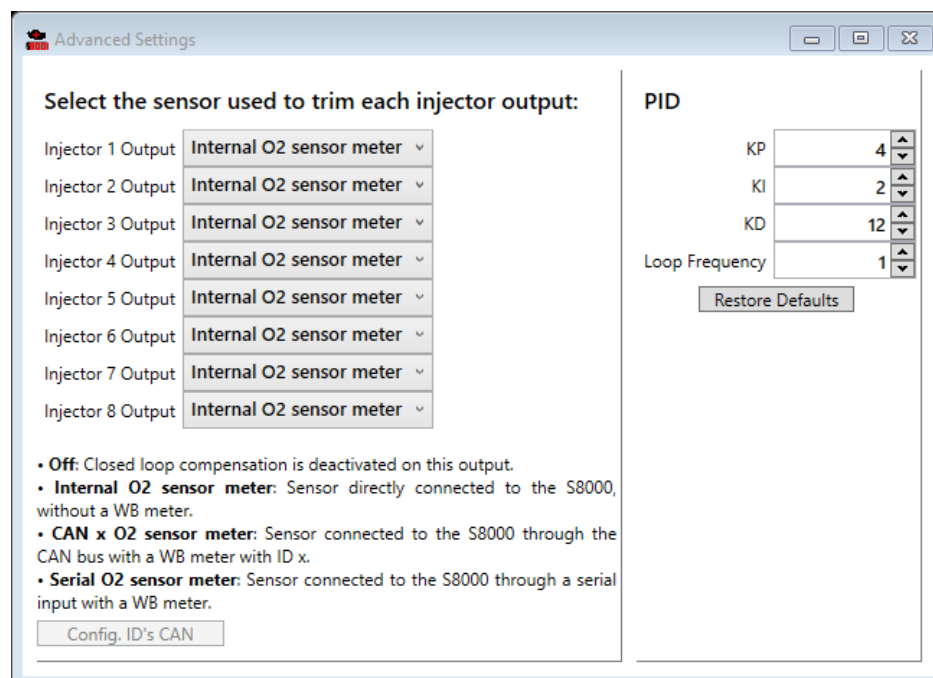
We indicate the use of the Bosh LSU 4.2, code: 0 258 007 351

7.13 INJEPRO Pressure Sensors - SPI-17/SPI-10

These pressure sensors are linear and can be used to inform to S8000 the oil, fuel, and water pressure, exhaust backpressure, etc. The SPI-17 has a reading range of 0 to 17BAR and the SPI-10 of 0 to 10BAR, and normally is installed to monitoring in the datalogger of the module.

But they can be used for security too. In the menu Screen and Alerts Settings is possible to set a minimum oil pressure to engine shutdown, in cases the oil pressure comes in a level lower than the programmed, the engine automatically switches the engine off, and to restart the engine is necessary to switch on the ignition again.

These sensors are used for the reading the EBC control pressure (EBC Pressure), that is taken in the wastegate valve, necessary for the working of the integrated EBC.

Its supply is done through the 5 volts and the battery ground, the signal must be connected on one of 14 white entries (input) and manually configured.

On the software by selecting an input as a pressure sensor, at the side you choose the sensor that is being used. We have pre-configured the SPI-17 and SPI-10 ones. If using other, make sure it is linear, and insert in the software the maximum reading pressure of it.
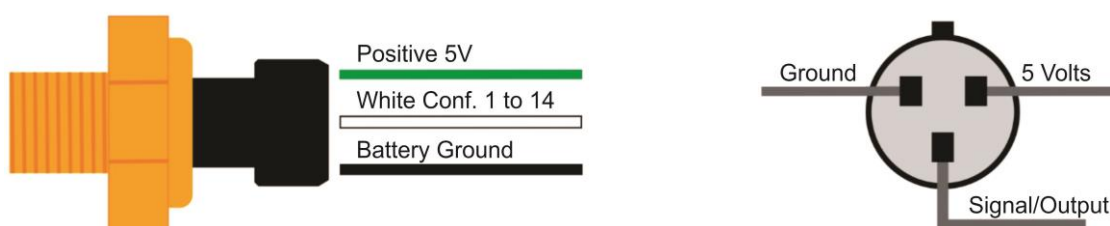
These sensors, after installed, must be calibrated for correct reading from the module. Read the section "EXTERNAL PRESSURE SENSORS CALIBRATION" for information on how to do this calibration.

7.14 Integrated MAP Sensor

This sensor informs to S8000 the absolute pressure in intake manifold. The vacuum reading is done through a hose which must be connected to the intake manifold between the TBI and the head, preferably far from the throttle in order to an accurate reading of the engine load. The vacuum/pressure line must not be shared with valves and gauges, we recommend the use of a hose type PU with 6 mm external e 4 mm internal and the hose should be as short as possible, in order to avoid reading errors. When using the multi-throttle system it is necessary to interconnect all cylinders in order to a correct reading without variations.

This sensor must be calibrated too. Read the section MAP CALIBRATION for more information.
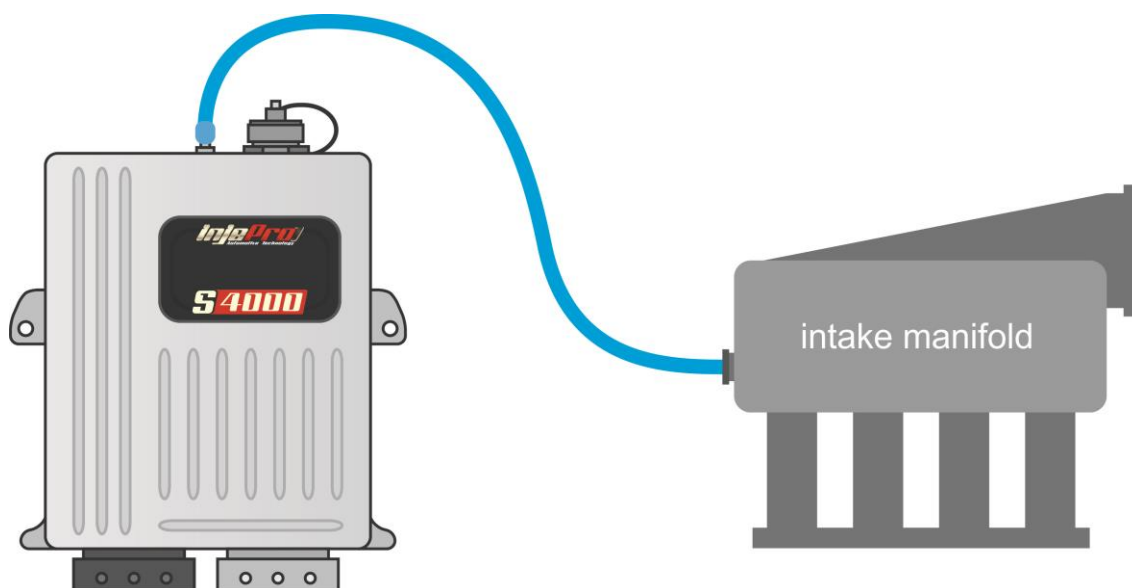
7.15 External MAP Sensor

In aspirated engines which use the original admission collector, it is possible to use the MAP sensor that is attached to the collector. The original MAP signal can be connected in any of the 14 configurable inputs (white 1 to 14) and when the input is configured as external MAP, the integrated MAP is ignored. After connecting and configuring the input, is necessary to make the sensor calibration in order that the reading stays 0.0 BAR with the engine off. Read the section EXTERNAL PRESSURE SENSORS CALIBRATION for details.

Example of sensor connection MAP GM/VW with integrated air temperature:
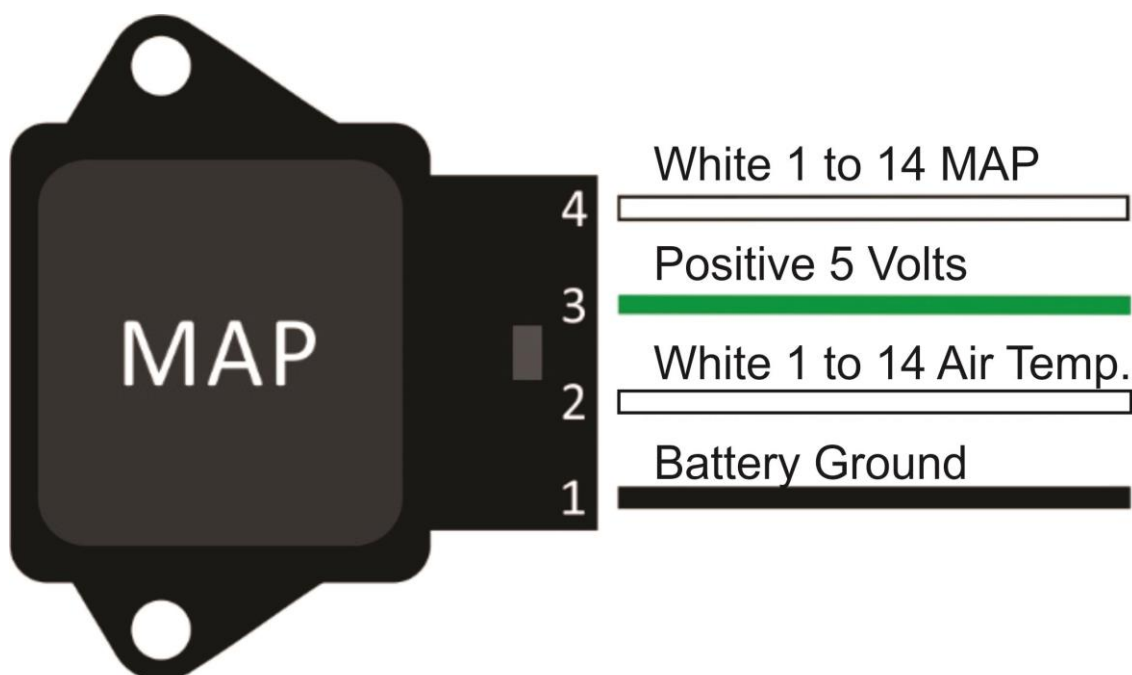
7.16 Strain Gage Sensor

The strain gage sensor is used to read the amount and the direction of the force applied in the gear lever. It is used by the integrated EGS in the control of the ignition cut (without taking the foot off of the throttle pedal) for the coupling of the gear in gearboxes with quick coupler.

For the reading of this sensor in the S8000 is necessary the signal conditioner Strain Gage. It conditions the signal of the sensor and interfaces with the S8000 module. It has an analogic output that must be connected to one of the 14 white inputs of the S8000. The section EGS-PRO READING CALIBRATION shows how to calibrate this sensor. In addition, the section EGS INTEGRATED talks about its configuration.

S8000 battery ground mesh
White 1 to 14 wire
S8000 12V power
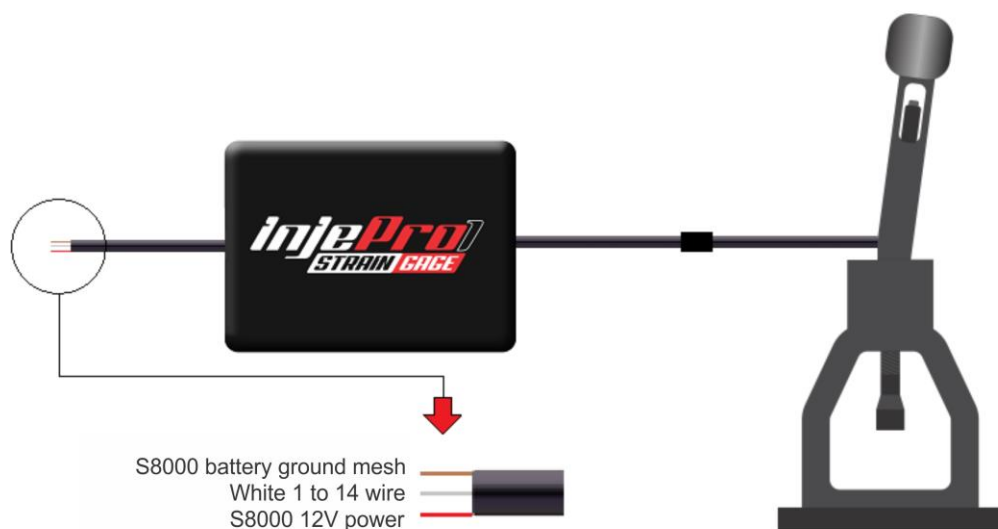
7.17 Pyrometers (EGT/EGT-4)

The pyrometers are used to measure the temperature inside the cylinders. The modules EGT and EGT-4 allows the connection of these sensors directly to the S8000. With this, you can record these temperatures in the datalogger, which gives more information to find the best setup for the engine.

The EGT module is a conditioner for one pyrometer. It has an analogic output that can be connected to one of the 14 white inputs of the S8000. The S8000 does not have a specific configuration for the EGT, so the input must be configured as "Analogic 0-5V", recording the temperatures in voltage without conversions.

The EGT-4 is a conditioner that allows to connect up to 4 pyrometers. It has 4 analogic outputs that can be used in the same way as the EGT explained above. However, the better way to use the EGT-4 is through the CAN network, where only 2 wires makes the entire communication, and values are already recorded in temperature units. The figure below shows how to make the electric connections, and the section CAN DEVICES ID SETUP shows the other adjustments necessary for the correct communication.

Pyrometers
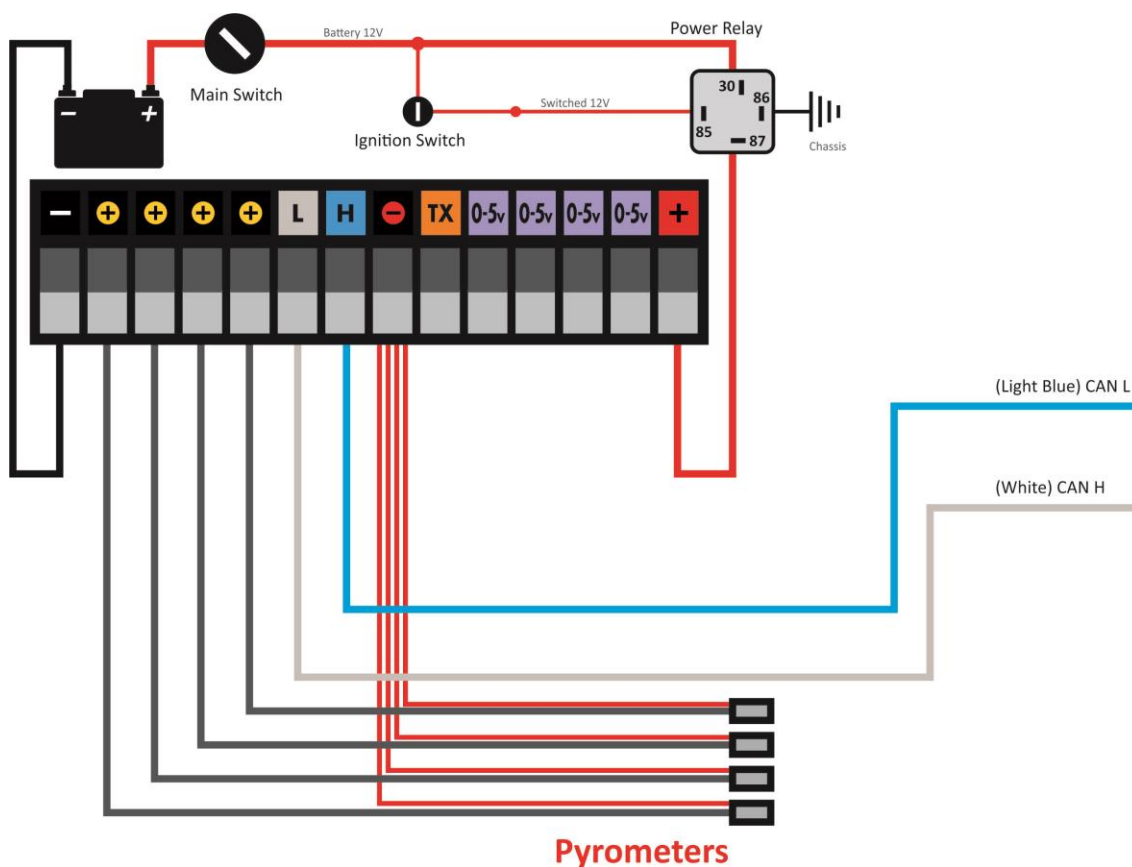
8 ACTUATORS

8.1 Fuel Injectors

The S8000 has 8 main outputs to control fuel injectors, in each of them it is possible to connect up to 8 injectors of high impedance (up to 12 ohms). To connect a bigger number of injectors of high impedance per output or to connect low impedance injectors (2 to 8 ohms) it is necessary the use of the external module PEAK HOLD.

The outputs are the blue wires numbered from 1 to 8. It is recommended the individual connection of injectors in order to use the sequential injection feature and individuals compensations per cylinder. We recommend that the cylinders sequence follow the outputs sequence, example: output 1 cylinder 1, output 2 cylinder 2, output 3 cylinder 3, output 4 cylinder 4, and so on. The order of injection pulses and the injection mode (Sequential, Semi or Multi Point) will be defined by the user in the sequence/outputs table in the dedicated software.

To be able to use the sequential fuel injection feature, it is necessary that the RPM reading be made through the crank trigger wheel together with the cam sync sensor. If the RPM reading is made using the distributor, it is necessary that it be with the 1st window larger (same system which provide the VW AP Mi). For semi sequential fuel injection it is necessary just the crank trigger wheel or the distributor with the 1st window larger.

Examples of Injectors Connection and table settings of injection order in dedicated software S8000

8.1.1 Example 1

Four cylinders engine in line (explosion order 1 – 3 – 4 – 2) with a bank of injectors in semi sequential mode. The injection outputs are connected in cylinder order and the engine explosion order is configured in injection table. Notice in the table that each output pulses only once in each engine cycle.

Output Seq.	1	2	3	4	5	6	7	8
1	✔							
2			✔					
3				✔				
4		✔						

8.1.2 Example 2

Four cylinders engine in line (explosion order 1 – 3 – 4 – 2) with a bank of injectors in semi sequential mode, using 4 injectors outputs. The injection outputs are connected in cylinder order and the pulses sequence are selected in the injection table. Notice in the table that the cylinders 1/4 and 2/3 pulses twice in each engine cycle.

Saida Seq.	1	2	3	4	5	6	7	8
1	✔			✔				
2		✔	✔					
3	✔			✔				
4		✔	✔					

8.1.3 Example 3

Four cylinders engine in line (explosion order 1 – 3 – 4 – 2) with a bank of injectors in semi sequential mode, using 2 injectors outputs. The output 1 sets together the injectors 1/4 and the output 2 sets together the injectors 2/3. The pulses sequences are selected in the injection table. Notice in the table that the cylinders 1/4 and 2/3 pulses twice in each engine cycle.

Output 1	Injection map 1	∨
Output 2	Injection map 1	∨
Output 3	Injection map 1	∨
Output 4	Injection map 1	∨
Output 5	Injection map 1	∨
Output 6	Injection map 1	∨
Output 7	Injection map 1	∨
Output 8	Injection map 1	∨

Saida Seq.	1	2	3	4	5	6	7	8
1	✓							
2		✓						
3	✓							
4		✓						

8.1.4   Example 4

Four cylinders engine in line (explosion order 1 – 3 – 4 – 2) with two bank of injectors, the first one in sequential mode, and the second one in semi sequential mode. In the first bank, the injectors outputs are connected in the cylinders order and the engine explosion order is set in the injection table, in the other hand, in the second bank the outputs are connected in the cylinders pairs and the fuel injection table that is used to outputs 5 and 6 is the map 2. Notice in the table that in the first bank each output pulses only once in the complete engine cycle and in the second bank we have 2 pulses in each output in complete cycle (1, 2, 3, and 4). For each injector output, it is possible to choose from 4 tables (bank A, B, C, D), in a 4 cylinders engine for instance, it is possible having 1 full fuel injection table for each cylinder and, instead of working in the individual compensations, it can change the values straight in the table of each cylinder.

First Sequencial Bank – Injection Map 1

Blue Wire nº1
Blue Wire nº2
Blue Wire nº3
Blue Wire nº4

Power 12V

Cylinder 1   Cylinder 2   Cylinder 3   Cylinder 4

Map selection

Output 1	Injection map 1 ⌄
Output 2	Injection map 1 ⌄
Output 3	Injection map 1 ⌄
Output 4	Injection map 1 ⌄
Output 5	Injection map 1 ⌄
Output 6	Injection map 1 ⌄
Output 7	Injection map 1 ⌄
Output 8	Injection map 1 ⌄

Second Semi Sequencial Bank – Injection Map 2

Blue Wire nº5
Blue Wire nº6

Power 12V

Cylinder 1   Cylinder 2   Cylinder 3   Cylinder 4

Injection Sequence

Saida / Seq.	1	2	3	4	5	6	7	8
1	✔				✔			
2			✔			✔		
3				✔	✔			
4		✔				✔		

8.1.5   Example 5

Six cylinders engine in line (explosion order 1 – 5 – 3 – 6 – 2 – 4) with a bank of injectors in sequential mode. The injection outputs are connected in the cylinders order and the engine explosion order is configured in the injection table. Notice in the table that each output pulses only once in each engine cycle.

Blue Wire nº1
Blue Wire nº2
Blue Wire nº3
Blue Wire nº4
Blue Wire nº5
Blue Wire nº6

Power 12V

Cylinder 1   Cylinder 2   Cylinder 3   Cylinder 4   Cylinder 5   Cylinder 6

Map selection

Output 1	Injection map 1 ⌄
Output 2	Injection map 1 ⌄
Output 3	Injection map 1 ⌄
Output 4	Injection map 1 ⌄
Output 5	Injection map 1 ⌄
Output 6	Injection map 1 ⌄
Output 7	Injection map 1 ⌄
Output 8	Injection map 1 ⌄

Injection Sequence

Out. / Seq.	1	2	3	4	5	6	7	8
1	✔			✔				
2					✔			
3			✔					
4						✔		
5		✔						
6			✔					

8.1.6   Example 6

Eight cylinder engine, which explosion order is 1 – 8 – 7 – 2 – 6 – 5 – 4 – 3, with a bank of injectors in sequential mode. The injection outputs are connected in the cylinders order and the engine explosion order is configured in the injection table. Notice in the table that each output pulses only once in each engine cycle.

Map selection

Output 1	Injection map 1 ∨
Output 2	Injection map 1 ∨
Output 3	Injection map 1 ∨
Output 4	Injection map 1 ∨
Output 5	Injection map 1 ∨
Output 6	Injection map 1 ∨
Output 7	Injection map 1 ∨
Output 8	Injection map 1 ∨

Injection Sequence

Out.\Seq.	1	2	3	4	5	6	7	8
1	✓							
2								✓
3							✓	
4		✓						
5						✓		
6					✓			
7				✓				
8			✓					

8.1.7   Example 7

When we are treating about 12 cylinders engine we need to change the injectors' installation strategy. We previously informed that the correct method to make the harness would be following the wires' number sequence according to cylinders' sequence. However, for this type of engine we need to make the harness in a different method. If this engine's ignition sequence is 1 – 7 – 5 – 11 – 3 – 9 – 6 – 12 – 2 – 8 – 4 – 10, we must connect all 6 injectors' outputs in the even cylinders. So that the fuel injection will be semi sequential and, in this case, the CAM Sync sensor installation is not needed.

Map selection

Output 1	Injection map 1
Output 2	Injection map 1
Output 3	Injection map 1
Output 4	Injection map 1
Output 5	Injection map 1
Output 6	Injection map 1
Output 7	Injection map 1
Output 8	Injection map 1

Injection Sequence

Out. Seq.	1	2	3	4	5	6	7	8
1	✓							
2		✓						
3			✓					
4				✓				
5					✓			
6								
7	✓							
8		✓						
5			✓					
6				✓				
7					✓			
8						✓		

8.2   Ignition Coils

The S8000 has 8 outputs to ignition control, they can directly control coils with internal igniter. For coils that do not have internal igniter it is necessary the use of the module INJEPRO ISD.

The outputs are made by the gray wires numbered 1 to 8. When using the multi-coils system (one per cylinder) it is recommended the outputs connection in the cylinder order, example : output 1 cylinder 1, output 2 cylinder 2, output 3 cylinder 3, and so on.

The ignition order and the ignition type (sequential or wasted spark) will be defined in the table of sequences/outputs by the user in the dedicated software.

When the RPM reading is being made through the distributor, or it is using the distributor only to distribute the spark, the ignition output must be the yellow 5 wire found in the pin 38 of the S8000.

8.2.1   Example 1

System with only one simple 3 wire-coil and with internal igniter using the distributor to read RPM, or crank trigger wheel to read RPM and the distributor only to distribute the spark. In this case, it is required to connect the ignition output in **yellow 5 wire**. In the inputs/outputs configuration tab, set this output as **Distributor Ignition** and in the ignition setup, set the ignition output as **Falling Edge ISD/Internal Igniter.** In this kind of configuration, the gray outputs from 1 to 8 are free to be used in other functions and the ignition sequence table is inactive, because in each injection pulse it will have an ignition in this output, according to the number of configured cylinders.

Recommended Dwell: 3.60 Initial X 3.30 Final. (The higher the number of cylinders, the smaller the time to the load, unload and rest the coil, so monitor the ignition module temperature and if it is overheating, quickly decrease the Dwell).

Pin 1: Power Ground
Pin 2: Signal
Pin 3: Switched 12V

3 2 1

+12V Power
Yellow Wire nº5
Chassis
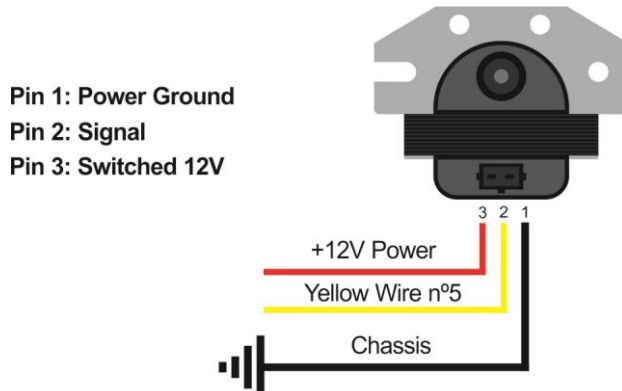
8.2.2 Example 2

System with only one simple 2 wire-coil without the internal igniter and with a spark amplifier (capacitive ignition module) using the 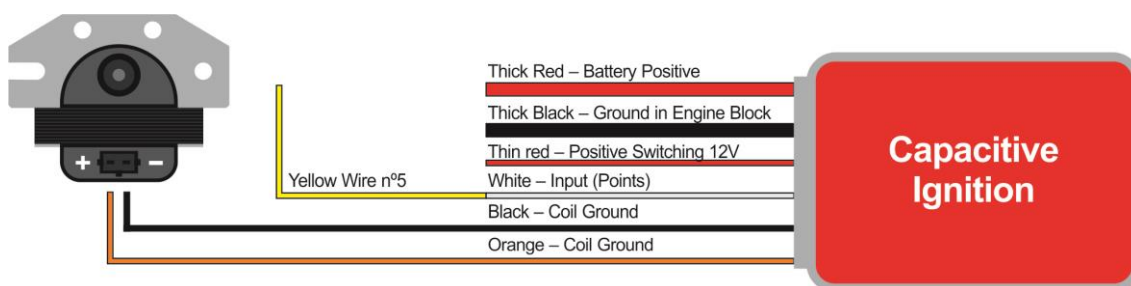distributor to read RPM, or crank trigger wheel to read RPM and the distributor only to distribute the spark. In this case, it is required to connect the ignition output in **yellow 5 wire**. In the inputs/outputs configuration tab, set this output as **Distributor Ignition** and in the ignition setup, set the ignition output as **Rising Edge MSD.** In this kind of configuration, the gray outputs from 1 to 8 are free to be used in other functions and the ignition sequence table is inactive, because in each of injection pulse it will have an ignition in this output, according to the number of configured cylinders.

This type of module applies a fixed Dwell in the coil, becoming unnecessary this configuration in the menu.

Thick Red – Battery Positive
Thick Black – Ground in Engine Block
Thin red – Positive Switching 12V
Yellow Wire nº5   White – Input (Points)
Black – Coil Ground
Orange – Coil Ground

Capacitive Ignition

8.2.3 Example 3

Four cylinders engine with a double coil of GM Astra/ Vectra together with the ISD-2 working in 'wasted spark'.

Menu Configuration: Falling Edge ISD/Internal Igniter.

Recommended Dwell: 3.80 Initial X 3.20 Final.

Output Settings

| Grey 1 | Map of Ignition 1 |
| Grey 2 | Map of Ignition 2 |

Out. Seq.	1	2	3	4	5	6	7	8
1	✓							
2		✓						
3	✓							
4		✓						

Grey Wire nº2
Grey Wire nº1

Power +12V
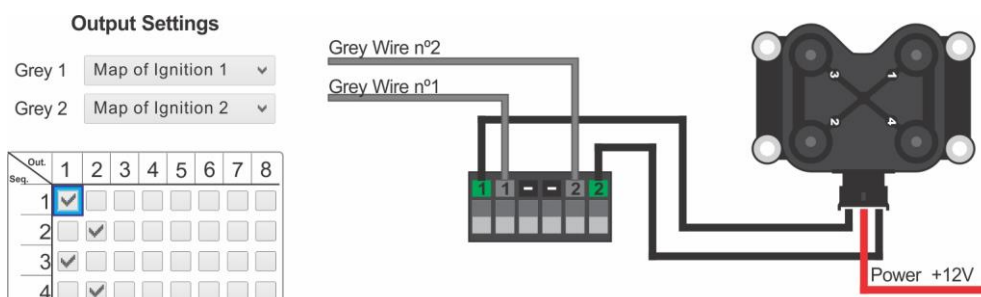
8.2.4 Example 4

Four cylinders engine in line (explosion order 1 – 3 – 4 – 2) with 4 coils of FIAT Marea together with the ISD-4 working in sequential mode.

Menu Configuration: ISD/Coil with Ignition.

Recommended Dwell: 2.80 Initial X 2.20 Final.

8.2.5 Example 5

Four cylinder engine in line (explosion order 1 – 3 – 4 – 2) with 4 coils of FIAT Marea together with the ISD-4 working in wasted spark using 4 ignition outputs.

Menu Configuration: Falling Edge ISD/Internal Igniter.

Recommended Dwell: 2.80 Initial X 2.20 Final.

8.2.6 Example 6

4 cylinder engine in line (explosion order 1 – 3 – 4 – 2) with 4 coils of FIAT Marea together with ISD - 4 working in wasted spark using only 2 ignition outputs

Menu Configuration: Falling Edge ISD/Internal igniter.

Recommended Dwell: 2.80 initial x 2.20 final.
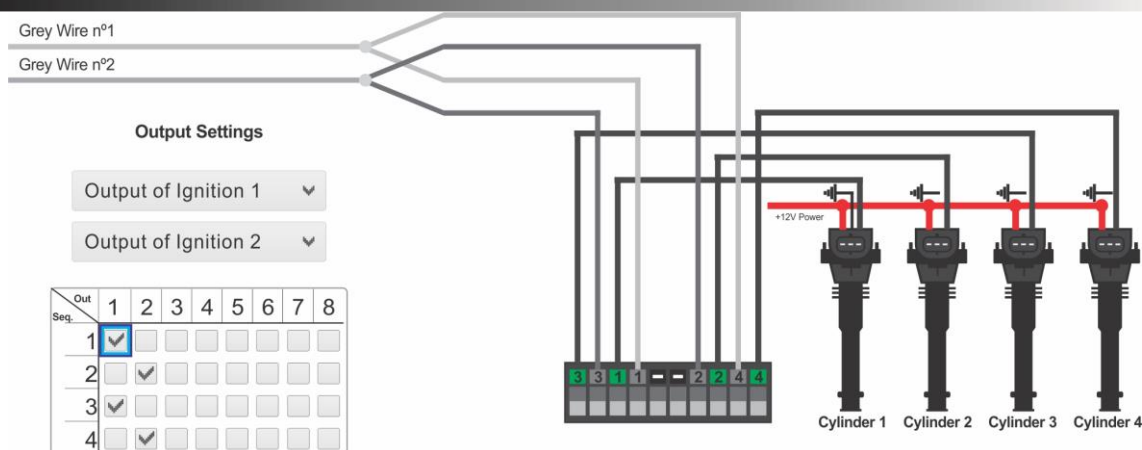
8.2.7 Example 7

Six cylinder engine in line (explosion order: 1 – 5 – 3 – 6 – 2 – 4) with 3 coils of FIAT Uno together with ISD - 4 working in wasted spark.

Menu Configuration: Falling Edge ISD/Internal igniter.

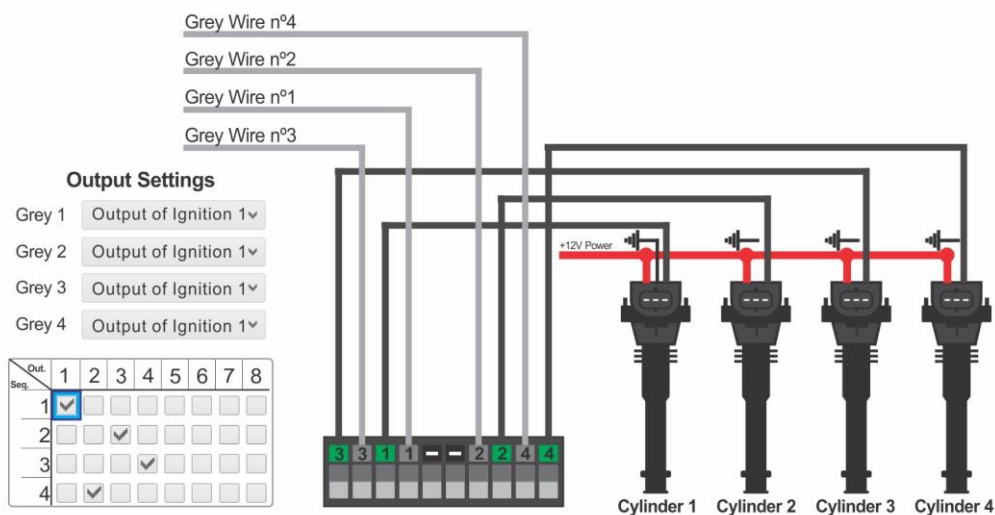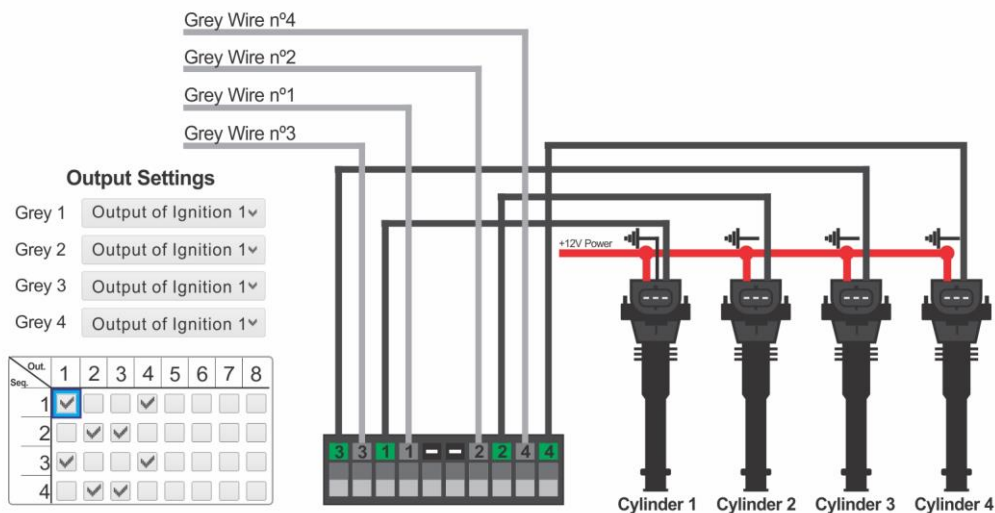**Recommended Dwell: 3.40 initial x 3.20 final.**
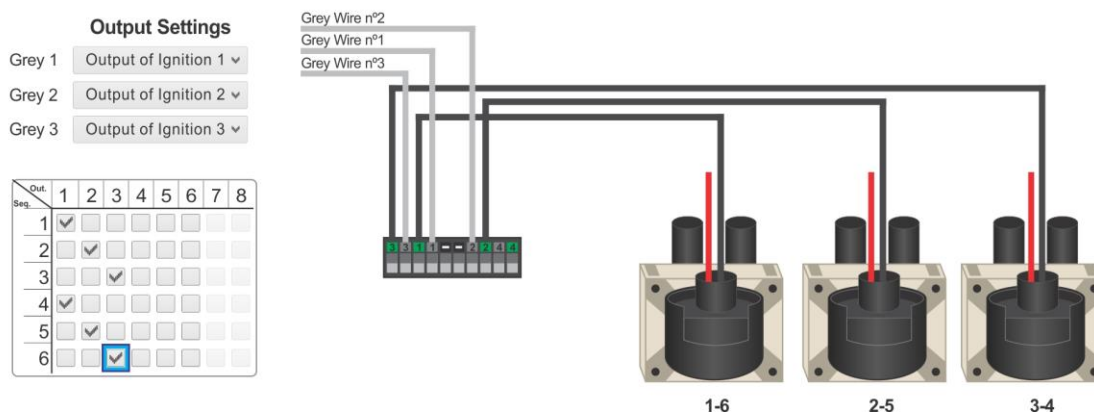
8.2.8 Example 8

Six cylinder engine (explosion order 1 – 5 – 3 – 6 – 2 – 4) with 3 coils of FIAT Marea, together with ISD – 6 working on sequential mode.

Menu Configuration: Falling Edge ISD/Internal igniter.

Recommended Dwell: 2.80 initial x 2.20 final.
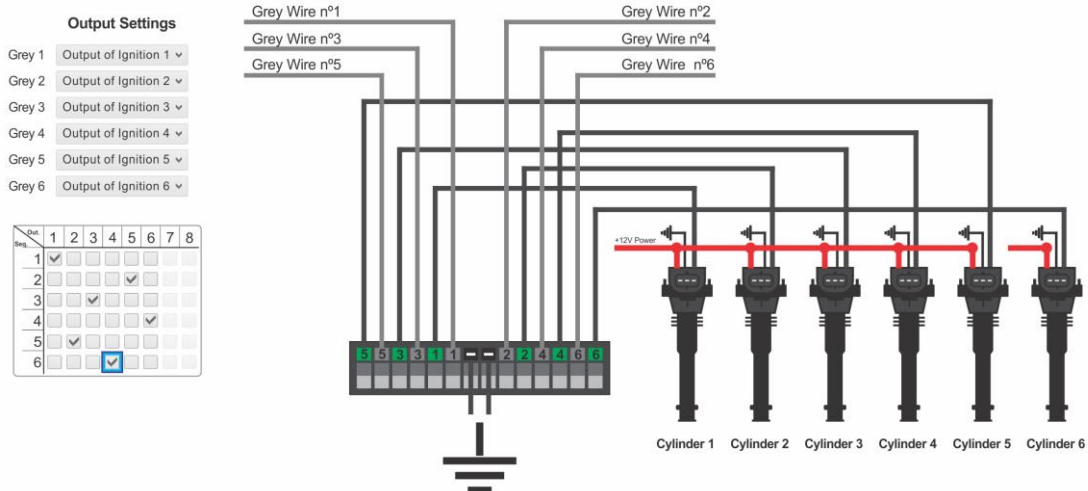
8.2.9   Example 9

GM V8 Engine (explosion order 1 – 8 – 4 – 3 – 6 – 5 – 7 – 2) with 8 coils of FIAT Marea, together with 2 ISD - 4, working in sequential mode.

Menu Configuration: Falling Edge ISD/Internal Igniter.

Recommended Dwell: 2.80 initial x 2.20 final.

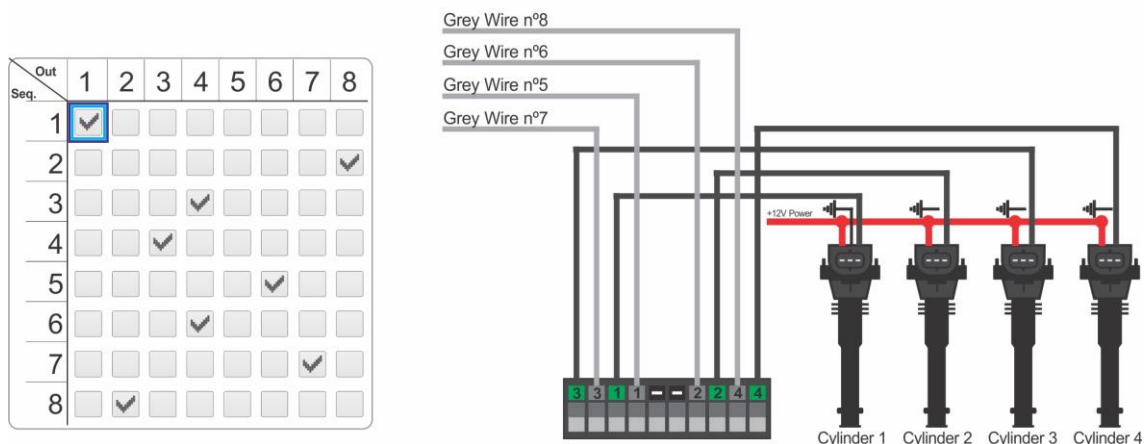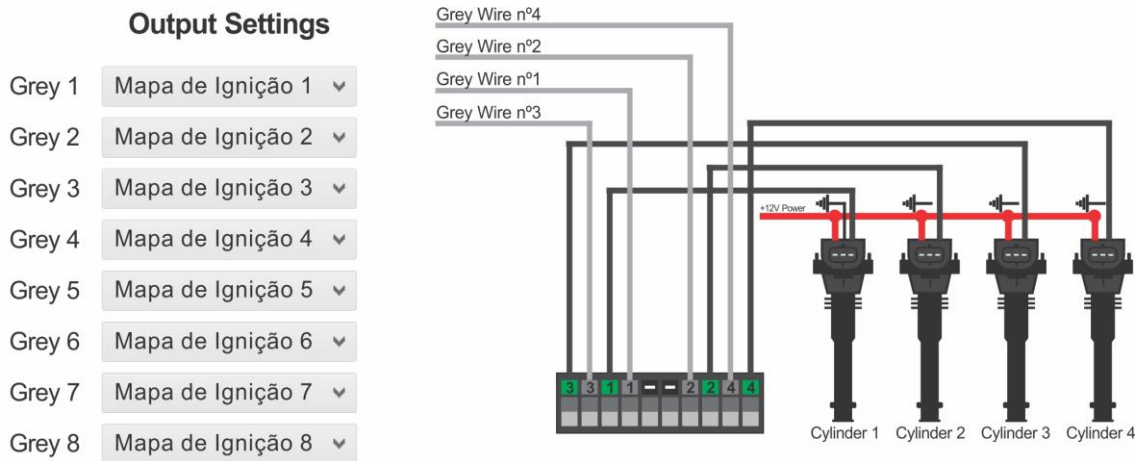Choose properly the outputs and inputs configuration of the module, as well as module's main settings of ignition and injection, in order to avoid damages in engine's components or INJEPRO modules.

8.3 Table of the Connection of the Most Used Individual Coils

Coil	Application	Type	Pin Connection
FIAT/Bosch 0 221 504 014	**Marea 5 cylinders 2.0 Turbo, 2.4**	**Without Internal Igniter**	**Pin 1: ISD Output** **Pin 2: Head Ground** **Pin 3: Switched 12V (relay)**
VW/Audi 20V, BMW	**Audi 1.8 20V Turbo, BMW 328, Golf 1.8 20V Turbo**	**Without Internal Igniter**	**Pin 1: ISD Output** **Pin 2: Head Ground** **Pin 3: Switched 12V (relay)**
FIAT/Hitachi CM 11-202	**Brava 1.8HGT, Marea 1.8 HGT**	**Without Internal Igniter**	**Pin 1: Switched 12V (relay)** **Pin 2: Head Ground** **Pin 3: Numbered Gray Wire**
Honda/Denso 099700-101	**New Civic**	**With Internal Igniter**	**Pin 1: Switched 12V (relay)** **Pin 2: Head Ground** **Pin 3: Numbered Gray Wire**

8.4 Link Table of Double Most Used Coils

Coil	Application	Type	Pin Connection
FIAT/Bosch F000ZS0103	**Uno 1.0, 1.5, Palio (two outputs)**	**Without Internal Igniter**	**Pin 1: ISD Connection** **Pin 2: Switched 12V (relay)**
GM/Bosch F 000 ZSO 203 F 000 ZSO 205	**Astra, Ipanema, Kadett, Vectra 8V**	**Without Internal Igniter**	**Pin 1: ISD Output** **Pin 2: Switched 12V (relay)** **Pin 3: ISD Output**
GM/FIAT/Bosch F 000 ZSO 213 F 000 ZSO 222	**Celta, Corsa, Gol AP Flex, Deriva, Montana, Vectra 16V**	**Without Internal Igniter**	**Pin 1: ISD Output 2** **Pin 2: Switched 12V (relay)** **Pin 3: ISD Output 1**
VW/Bosch 4 fios F000ZS0212	**Audi A3 e A4, Gol 1.0 16 Turbo, Gol/Golf 1.6 EA 111**	**With Internal Igniter**	**Pin 1: Gray Wire nº1** **Pin 2: Switched 12V (relay)** **Pin 3: Gray Wire nº2** **Pin 4: Head Ground**

| GM/Delphi (rounded) | **Corsa MPFI 1998 to 2002** | **With Internal Igniter** | **Pin A: Gray Wire nº2** |
			Pin B: Gray Wire nº1
			Pin C: Head Ground
			Pin D: Switched 12V (relay)
GM/Delphi (square)	**Corsa MPFI until 1997**	**With Internal Igniter**	**Pino 1: Switched 12V (relay)**
			Pino 2: Head Ground
			Pino 3: Gray Wire nº1
			Pino 4: Gray Wire nº2

8.5 Electronic Throttle

The electronic throttle is a valve that has a motor that does an electric connection to the pedal, and no mechanical, as in the cable throttle.

The advantages in its use are in the automatic controls it allows, as in the idle, crank, acceleration curve, etc.

The S8000 has an integrated electronic throttle, allowing you to connect the inputs and outputs directly in the sensors and actuators that involves this control. Among them are, the pedal sensors (Pedal 1 and 2), the throttle position sensors (TPS 1 and 2), and the outputs M1 and M2, that controls the activation of the throttle motor.

After the connection is ready, it is necessary to calibrate these sensors. The section CALIBRATING ELECTRONIC THROTTLE AT S8000 shows the steps for this.

The tab Throttle/Idle Control in the software contains the parameters of this control.
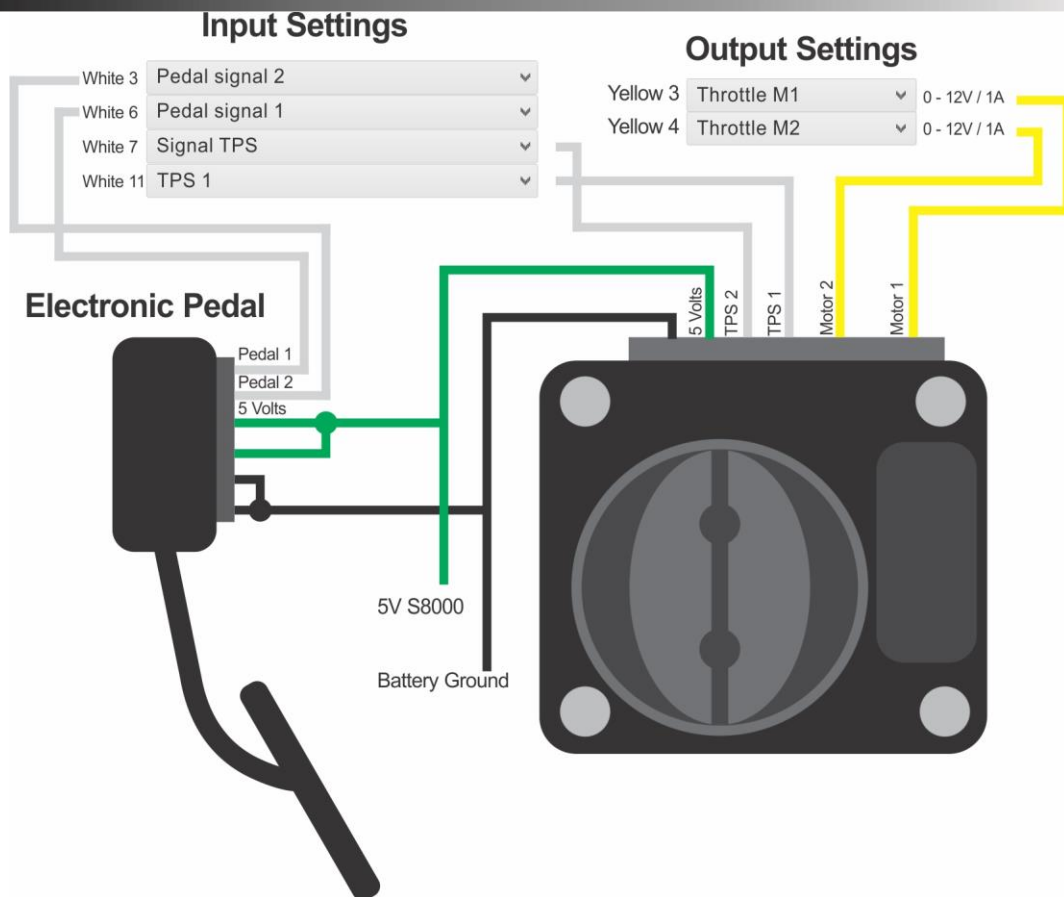
9   CALIBRATING ELECTRONIC THROTTLE AT S8000

Connect USB cable at S8000 and the other tip at computer, notebook or INJEPRO Display. Then open the S8000 software (available at our site www.injepro.com/downloads/) and observe if the connection was established.
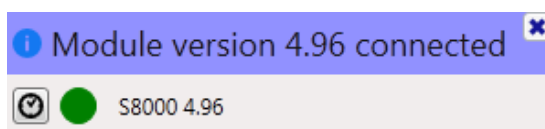
After connection is established, click at "Read Map" and "Map 1 (Active)".
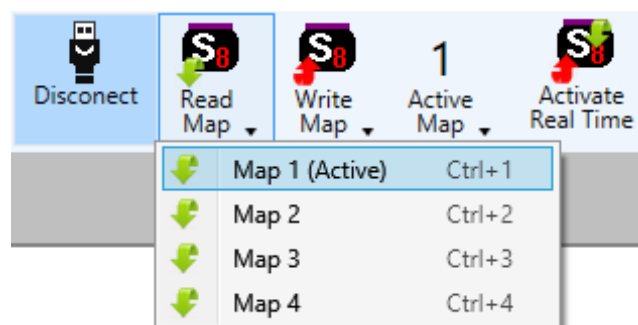
Next step is to click at "Activate Real Time", and then at "TPS Calibration". It is very important that the module **be fed through 12V.**
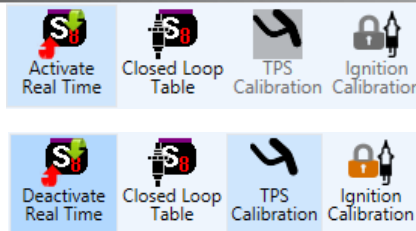
To succeed calibration, is just to follow the steps of the calibration wizard illustrated below.
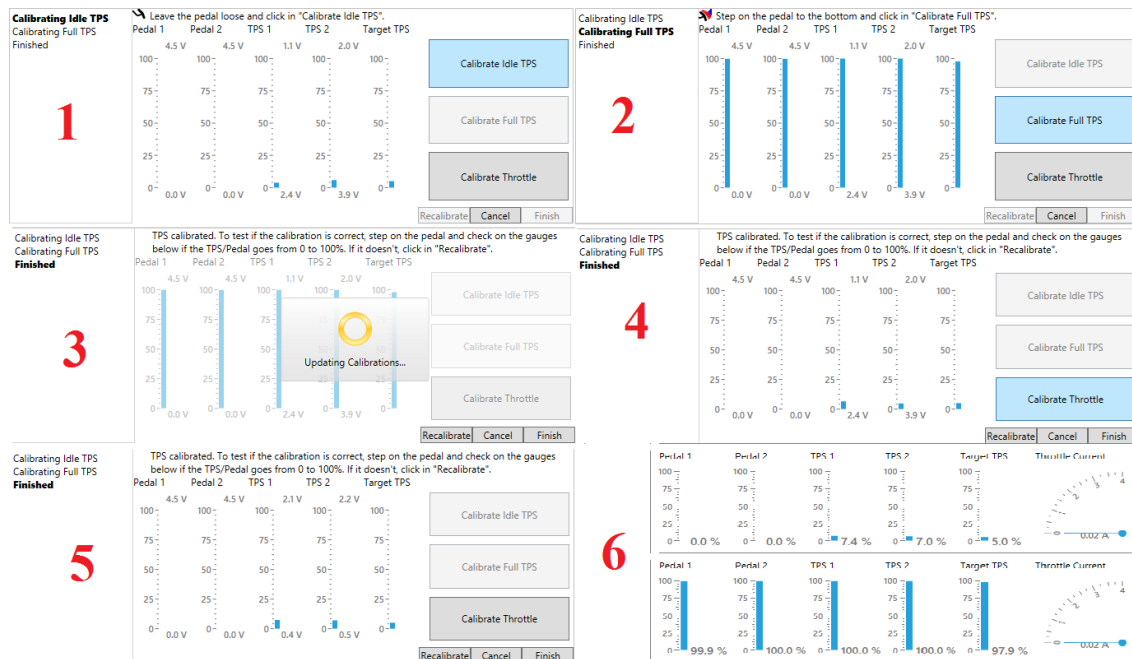
The image 6 shows throttle's consumption and the TPS's and pedals' positions. These parameters are important because shows the pedal's and throttle's ideal operation. Previously was explained about throttle's consumption be stable, and in this parameter we will observe it. These gauges are found at tab "Throttle/Idle Control".

After pedal and electronic throttle are calibrated the gauges Pedal1, Pedal 2, TPS 1, TPS 2 and TPS Target will have to change values.

The gauges Pedal 1 and Pedal 2 refer to vehicle's pedal position. As the majority electronic pedals are composed by two signals, that is, there are two resistances, S8000 needs to know pedal's position using these voltage references, so the higher is the resistance (loose pedal), the lower is the value shown, example 0%, and the lower is the resistance (pedal pressed), the higher is the value shown, example 100%.

10 TPS CALIBRATION WHEN MECHANIC THROTTLE

Connect the USB cable at S8000 and the other tip at computer, notebook or INJEPRO Display. Then, open the S8000 software (available at our site www.injepro.com/downloads/) and observe if the connection was established.

After the connection is established, click at "Read Map" and at "Map 1 (Active)".

The next step is to click at "Activate Real Time", and then click at "TPS Calibration". It is very important that the module **be fed through 12V**.
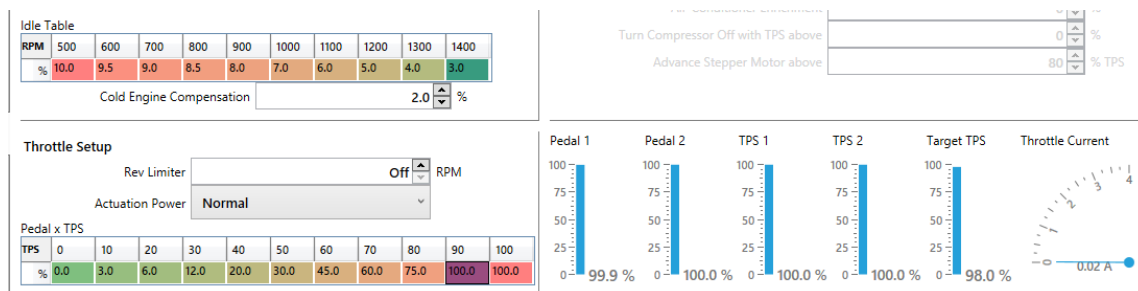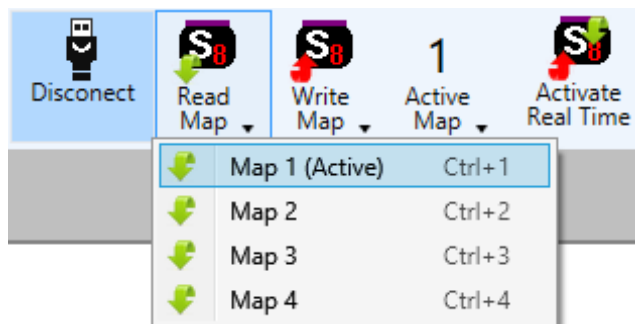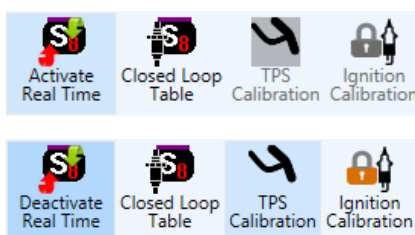

To succeed calibration, is just to follow the steps of the calibration wizard illustrated below.
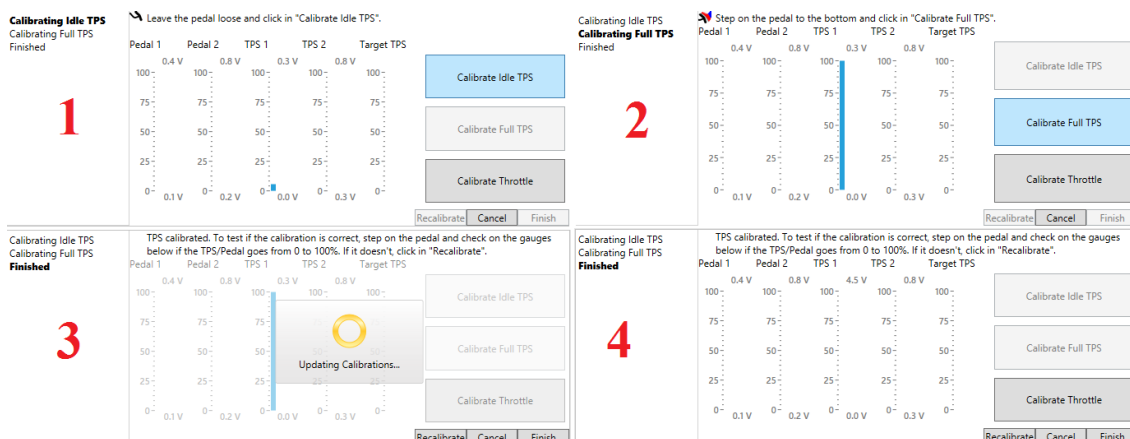
The button "Calibrate Throttle" at image 4 refers to electronic throttle use, so, when mechanic throttle is being used, this parameter is dispensable.

Before ending procedure, pressure the pedal and check its operation. If it is OK, then end the procedure. If not, repeat all the steps.

11 IGNITION TIMING CALIBRATION WHEN CRANK TRIGGER WHEEL

1- With the car working and stabilized in idle, connect the notebook by USB at S8000 module and then open the S8000 software;
2- Read the ACTIVE map;
3- Click at "Activate Real Time" and then at "Ignition Calibration";

4- At calibration wizard click at "Lock Ignition Timing";
5- Check ignition timing with timing light. It is important to remember that, when checking, must be identified 18 degrees, or 36 degrees ("wasted spark" mode). In this case, some timing light also duplicates RPM.

If 18 or 36 degrees cannot be identified, and the timing difference is until 6 degrees in a 60-2 crank trigger wheel, change value of "First Tooth Alignment" until find the exactly 18 or 36 degrees.

Images of timing calibration wizard and the calibration sequence are below.

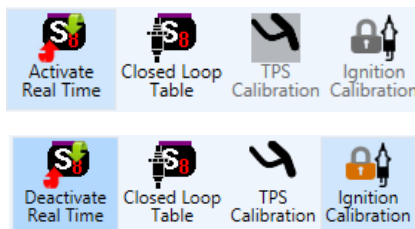At item 2, must change the first tooth alignment value if a timing divergence is identified or adjust the sensor alignment if the difference is more than 6 degrees. Then check the value with de timing light again. When everything is adjusted, unlock ignition timing and finalize the procedure.
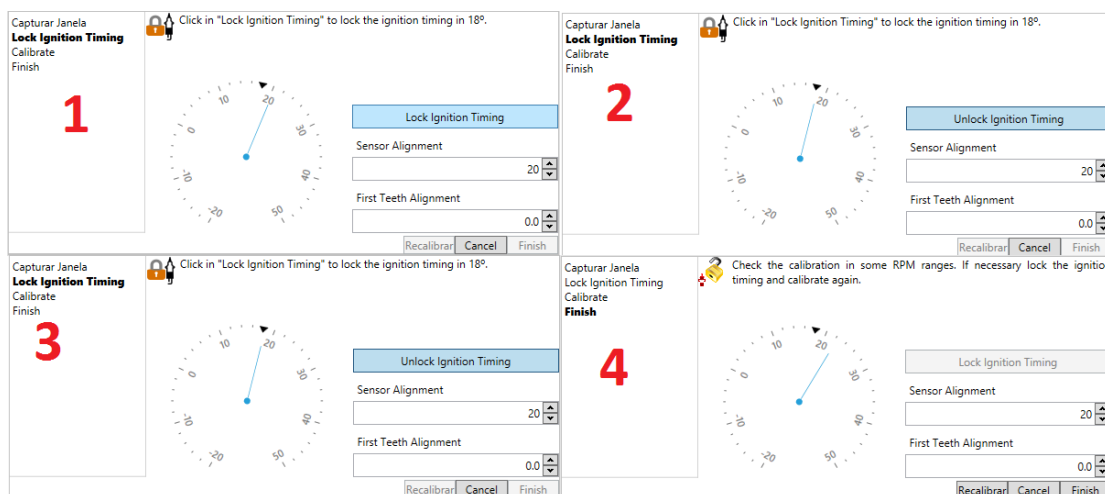
12 IGNITION TIMING CALIBRATION WHEN DISTRIBUTOR

1- With the car working and stabilizedle, connect the notebook by USB at S8000 module and then open the S8000 software;
2- Read ACTIVE map;
3- First click at "Activate Real Time";
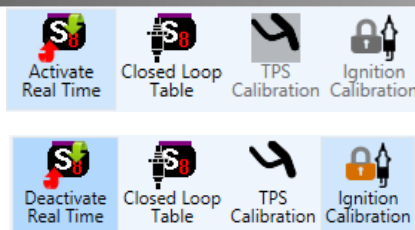
4- Click at "Ignition Calibration" and then "Capture window size". At this moment, S8000 automatically captures the window size, dispensing the manual adjustment. This option is essential because without it the ignition timing may fluctuate;
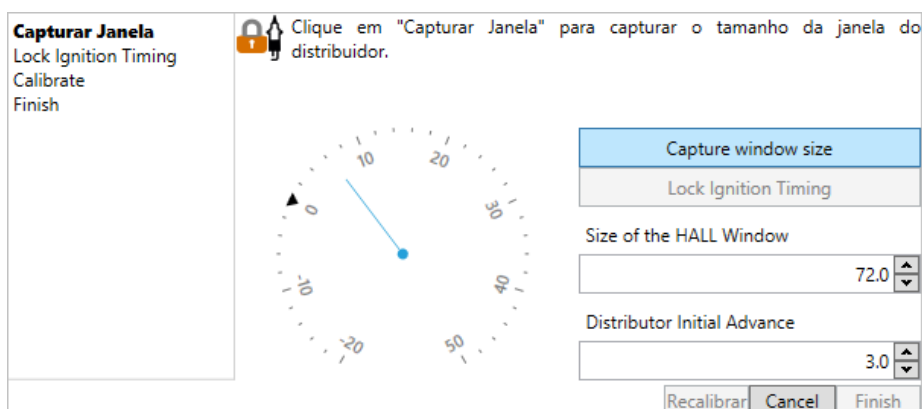
5- Then click at "Lock Ignition Timing". The ignition timing will point to 0°, so that is possible to check with the timing light the distributor's advance timing in degrees. After the timing is checked, insert this value at the field "Distributor Initial Advance". Repeat this procedure until timing light value is the same as in the field "Distributor Initial Advance".
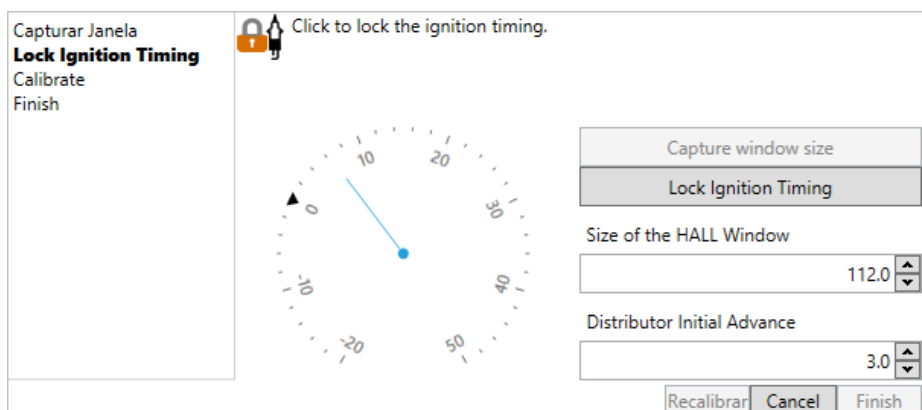
Capturar Janela
Lock Ignition Timing
Calibrate
Finish

Check the ignition timing with a timing light and change the distributor initial advance accordingly. Repeat this process until the timing light gives the below value. Then unlock the ignition timing.

Capture window size	
Unlock Ignition Timing	

Size of the HALL Window

112.0

Distributor Initial Advance

3.0

Recalibrar | Cancel | Finish

Capturar Janela
Lock Ignition Timing
Calibrate
Finish

Check the calibration in some RPM ranges. If necessary lock the ignition timing and calibrate again.

Capture window size	
Lock Ignition Timing	

Size of the HALL Window

112.0

Distributor Initial Advance

3.0

Recalibrar | Cancel | Finish

13 EXTERNAL PRESSURE SENSORS CALIBRATION

The pressure sensor calibration must be done while the vehicle is turned off and the key turned on. It is also important that the fuel line is depressurized.

At tab "Input/Output Setup", is possible to enable a specific input for each pressure sensor, as well as what sensor is being used (SPI-17, SPI-10 or Other).

As soon as the real time is activated, below each active pressure sensor will appear a calibration button.

Input Setup

White 1	Oil Pressure ⌄	SPI-17 ⌄

Calibrar

White 2	Fuel Pressure ⌄	SPI-17 ⌄

Calibrar

White 3	Sensor (Others) ⌄	SPI-17 ⌄
	Legenda Datalogger	INPUT3

Calibrar

White 4	Off ⌄
White 5	Off ⌄
White 6	Off ⌄
White 7	Off ⌄
White 8	Off ⌄
White 9	Off ⌄
White 10	Off ⌄
White 11	Off ⌄
White 12	Off ⌄
White 13	Off ⌄
White 14	Off ⌄

Datalogger Setup

By clicking "Calibrate", an adjustment gauge opens. At this moment click at the upper arrow until the gauge shows a value bigger than 0 bar. When this happen, get back to 0 bar pressure and it is calibrated.

Click in the arrows to change the calibration value until the gauge value is equal to the reference value.

5

3

7

2

8

0.00 bar

0

10
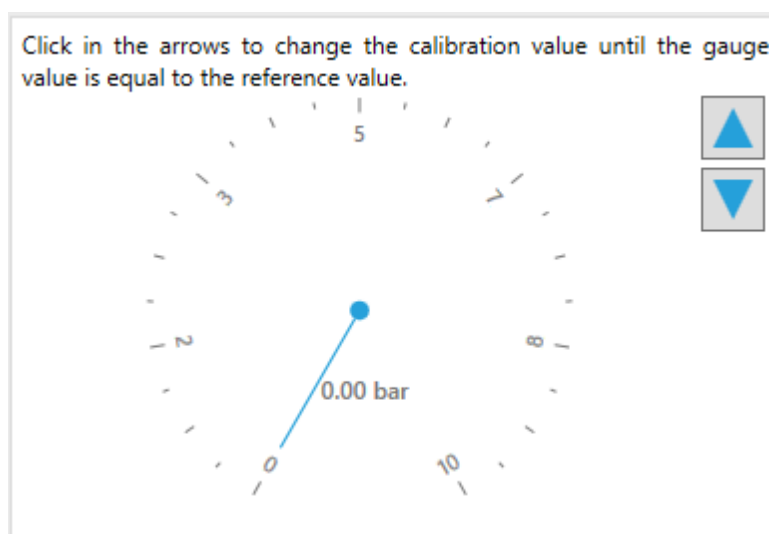
14 MAP CALIBRATION

When using an external MAP, the calibration is similar to the other external sensors, which was explained above (EXTERNAL PRESSURE SENSORS CALIBRATION).

When using the integrated MAP sensor we have other ways of calibration, but in all of them the vehicle must be turned off with the turned on.

The recommended way is through the "MAP Calibration" of "Connection Menu". This button opens the MAP calibration wizard, shown below. To enable this button, you must first activate the real time (section REAL TIME). In it, you can use the button "Auto Calibrate" that will calibrate automatically, searching for 0 bar. In case you wish to calibrate in another value, you can use the buttons with arrows up and down to search for other values in the gauge.
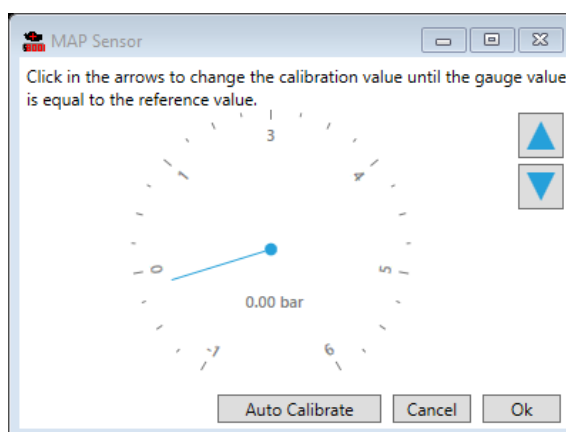
Another way of calibration, that must be used carefully, is resetting the module. For this you can use the Full Reset and Basic Reset. We recommend the basic reset because it does not lose the maps. Do not forget to source the device with 12V (key turned on), because otherwise the MAP will be descalibrated.

15 NARROW BAND O2 SENSOR CALIBRATION

The narrow band O2 Sensor can be calibrated to have a more precise reading.

For this use the button NB O2 Sensor Calibration of the Connection Menu. This button opens the wizard for this calibration (shown below). Use the arrows up and down to search for the desired value in the sensor. If you wish to go back to the default value use the "Restore Default" button.
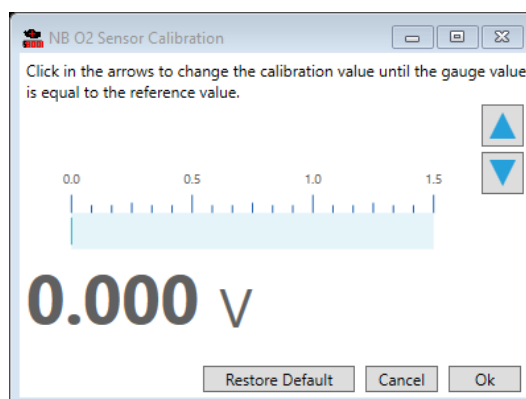
16 EGS-PRO READING CALIBRATION

The EGS-PRO is conditioner for the Strain Gage Sensor. It has an analogic output that can be connected to any of the 14 white inputs of the S8000 (that must be configured as "EGS Signal"). With this you can calibrate the reading (the vehicle must be turned off and the key turned on):

1. Activate the real time;
2. Click in "Calibrate" below the configured input;
3. In the wizard use the arrows up and down to search for the 2.5V in the gauge;
   a. If the gauge is marking 0V, the sensor is probably damaged. Contact the INJEPRO support for more information.

17 CAN DEVICES ID SETUP

You can connect WB-METER and EGT-4 devices.

The EGT-4 is a device that allows to connect 4 pyrometers to record cylinder temperatures in the dataloggers.

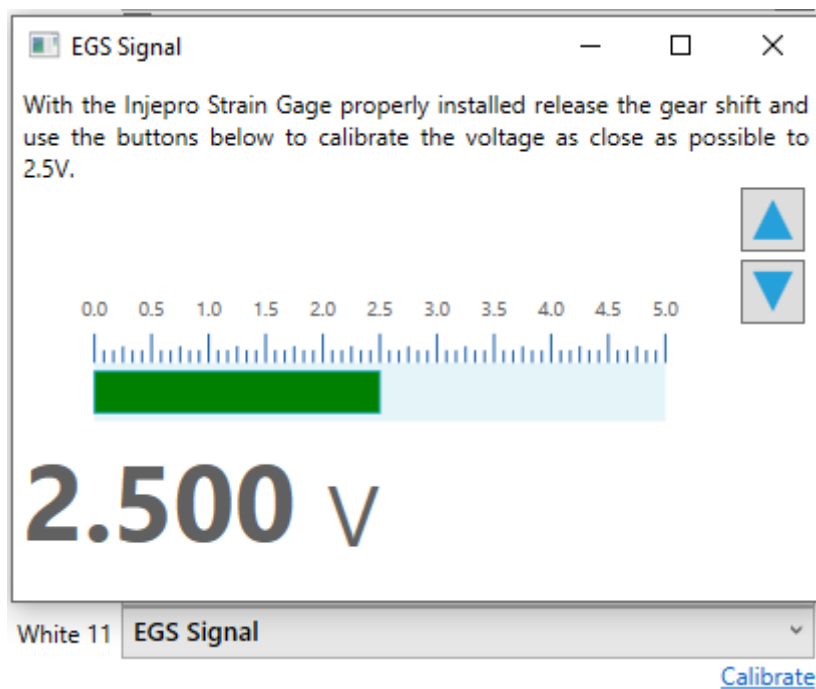The WB-METER is wideband O2 sensor conditioner. The S8000 already has one of these integrated, but through the CAN network you can connect more than one, allowing advanced closed loop setup. For more information read the section Wideband O2 Sensor.

To connect either EGT-4 or WB-METER devices, connect the CAN network blue wire of the devices to the CAN network blue wire of the S8000, and do the same with the CAN network white wire. Do not forget the power wires of these devices.

After the electric connection, for a correct working of the CAN communication, it is necessary to configure de ID of the devices. For this, follow the step below:

1- Connect the S8000 module in the USB;
2- Go to the "Connection" menu and click in "Config. ID's CAN";

3- Turn off any device that is connected in CAN, leaving on only the device you wish to change the ID;

4- Insert the desired ID and click in "Send".

18 EBC-PRO INTEGRATED

For a complete use is necessary that electrical and mechanical parts are in perfect condition. The entire system where CO2 gas passes, since the cylinder, register, regulator, solenoids, up to the top of the relief valve, must have a perfect seal.

The exhaust manifold and the relief valve must be correctly sized for the engine power, working with acceptable values of backpressure in the exhaust. Both must be able to relieve without large variations in all engine RPM ranges. The lower is the initial turbo pressure obtained by the spring load and valve diameter, the greater will be the electronic pressure control range, because the final turbo pressure will be the sum of the initial pressure with the pressure added by S8000 at the relief valve's superior part. It may have slight variations due to the backpressure generated at the exhaust manifold.

18.1 Booster Setup

18.1.1 Stage Exchange

18.1.1.1 Button/EGS
The stage exchange is made by the two-step activation button. Every press at the two-step makes S8000 exchange to the next stage. In addition, when it is used in conjunction with S8000 EGS, the module identifies the stage exchange in each gearshift.

18.1.1.2 Time
From the moment the two-step activation button is released, the time count is initiated and the stages will advance according to the time and number of stages configured.

18.1.1.3 RPM
The stage exchange happens when it reaches a preset RPM value within each of the 8 stages. That is, at each stage is possible to set a different exchange RPM from the previous stage.

18.1.1.4 Speed
The exchange occurs when reaches the speed defined by user in each one of 8 stages. To use this mode is required to have the free wheel speed sensor installed.

18.1.2 Pressure Search

18.1.2.1 Ramp
The initial and final pressure set within each stage gradually increases/decreases to the programed time.

18.1.2.2 Step
The pressure set at the stage increases/decreases instantly when a stage exchange occurs, without the option of timed initial and final pressure.

18.1.2.3 Minimum TPS to Activate
User determines a minimum value of TPS to actuate in the solenoid, avoiding waste of CO_2.

18.1.3 Time Disarm Booster
When enabled is possible to set a time between 1 to 100 seconds from the moment the two-step activation button is released for automatically disarm the EBC-PRO depressurizing the CO_2 system and avoiding waste.

18.1.4 Traction Control
This is an active turbo pressure control, which is based on difference between the traction wheel and the free wheel speeds. User defines the acceptable minimum and maximum slip speeds, and the minimum and maximum value to increment or decrement the pressure, keeping the vehicle within the programmed speed. Now integrated at S8000, besides the instantaneous pressure drop in case it has a very high slip speed, the injection will activate the torque active control through ignition timing delay, or create alternating spark failures between cylinders, decreasing engine power and slightly bringing the vehicle to the acceptable slip level.

18.1.5 Minimum Speed
For the pressure active control by speed do not influence on the two-step control, where the car slips a little bit more on the first meters to gain speed, is possible to set the minimum free wheel speed to start active control. In that way, user choose where the control starts. The recommended is to be at the end of the first gear after exiting the RPM control by time.

18.1.5.1 Minimum Difference in Km/h
When the slip speed is less than the minimum difference programmed, the active control increases the pressure progressively, reaching the maximum programmed increase pressure value when the slip speed is 0 km/h. When the slip speed is at this minimum, pressure is not added anymore. Between these two situations, the turbo pressure increase is interpolated. For example: if the minimum difference programmed is 10 km/h, and the pressure increase value is of 1 bar, when the slip speed is 0 km/h, the module will increase the pressure by 1 bar. When the slip speed reaches 5 km/h, the control increases 0.5 bars. Finally, when the slip speed reaches 10 km/h, it will not have any added pressure.

18.1.5.2 Maximum Difference in Km/h
When the slip speed is greater than the minimum difference programmed, the active control reduces the pressure progressively, reaching the maximum programmed pressure drop value when the slip speed is equal to this maximum difference. When the slip speed is at the minimum difference, the pressure stops decreasing. Between these two situations, the turbo pressure decrease is interpolated. For example: if the maximum difference programmed is 20 km/h, the minimum difference is 10 km/h, and the pressure drop value is of 1 bar, when the slip speed reaches 20 km/h the

module will drop the pressure by 1 bar. When the slip speed reaches 15 km/h, it decreases 0.5 bars. Finally, when the slip speed reaches 10 km/h, it will stop decreasing. If the slip speed exceeds 20 km/h, and the decrease of 1 bar is not enough to bring the speed to the acceptable range, the injection creates alternated spark failures, reducing the slip to the acceptable range even faster

18.1.5.3   Pressure Drop
It is configurable from 0.00 to 6.00 bars. It is the step used by the active traction control when it is necessary to decrease the pressure.

18.1.5.4   Additional Pressure
It is configurable from 0.00 to 6.00 bars. It is the step used by the active traction control when it is necessary to increase the pressure.

18.1.5.5   Burnout
To facilitate the heating of tires, it can set a fixed and instantaneous pressure from 0 to 6 bars. This function is activated by a signal coming from one of the configurable white wires and, after pressing the two-step button, this function is disabled automatically assuming the value set as the start pressure.

18.1.6   Parachute Control
To use this feature you must install, in conjunction with the manual activation system of the parachute, an electric traction mechanism, such as the electric lock of the Monza trunk, or some other type of motor that has the power and the necessary course to pull or push the rod. After this, the user can activate this control and set the time to automatically trigger the parachute. The S8000 EBC starts to count this time together with the stages time. It is also necessary to configure a minimum speed for the activation. This way the activation occurs only if the vehicle speed is equal to or above this value, e.g. trigger after 10 seconds and above 180 km/h. After the start, if the car reaches the speed of 180 km/h, at the instant of 10 seconds, the parachute is activated. It is very important to maintain the manual shaft of the parachute, so the pilot can trigger the parachute normally in the event of an emergency. To use this feature is mandatory to have at least the free wheel speed sensor installed. Note that this output is only a signal to drive an external relay that controls a parachute activation system.

18.1.7   Break Control
When the brake control is enabled, the S8000 EBC, through a specific output, manages the relay driving the solenoid of the line-lock, in order to prevent the feedback voltage from the solenoid, or from the relay itself, interferes with the functioning of the two-step.

19 EGS INTEGRATED

19.1   Menu Setup

19.1.1   Adjusting Gearshift Cut Time
At this menu is possible to set the time, in seconds, that the module system will cut the engine RPM during the vehicle gearshift. It is possible to set 5 different times, according to the necessary exchange time of each car's gear.

19.1.2 Adjusting Rearming Time

The RPM cutting system, during the gearshift, may be enabled stipulating a minimum waiting time to rearm the system. This is a safety feature that if, during the gearshift, occur a problem at the coupling, it assures that an unnecessary RPM cut do not occur.

19.1.3 Minimum RPM to Activate the Cutting System

It is possible to set a minimum RPM to activate the cutting system. If RPM is lower than the minimum RPM, the cut and the stage exchange will not occur. It is used as a safety feature. It is also possible to set a minimum RPM to each exchange, totalizing 5 different RPM.

19.1.3.1 Strain Gage or Shift Gear Sensibility

The movement sensor sensibility may be adjusted in 8 different levels. The level 1 is the least sensitive and the level 13 is the most sensitive. Adjust sensibility for that the voltage, when forcing lever back and forward, is around 1V to 4V. This is recommended to create a safety range of the limit that is 0V to 5V.

19.1.3.2 Actuation Mode

 It is very important to define correctly which will be the system actuation mode. If it is "Strain Gage" all 5 stages will work progressively, only returning to first stage after pressing two-step button again. If "Shift Gear" is the actuation mode, the system will act in a cyclic form, acting on both forcing ways of the lever. This configuration is indicated to circuit and drag races, where user do not use two-step control or use sequential gearbox, where gearshifts are all done in the same way.

19.1.3.3 Actuation Force

The correct lever actuation force calibration is very important. The value calculated in Volts or Kilogram-force will be the minimum variation value which will be added on the sensor's static value at the gearbox lever, when it is triggered. Therefore, when is set a very high value, user will have to make more strength to activate the system. Otherwise, when is set a very low value, it may occur the undesirable system activation. The informed value for calibration may vary according to the gearbox lever size and its operation system. Usually a lever with sensibility correctly calibrated has actuation force value close of 0.8V.

20 SOFTWARE

The INJEPRO S8000 has 3 main forms of manipulation of parameters:

- Software S8000: software for Windows PC.
- Tune – Up: external keyboard with communication USB and CAN.
- Display INJEPRO: display touch screen.

In the following sections, it is made a description about the use and the functions of the software S8000. This software is the standard way to manage the module, and its installation is free, and can be done through download in INJEPRO website (www.injepro.com/downloads).

All functions available in the module can be accessed and used through the software, as well as additional tools that the software offers which facilitate the setup and handling the module.

Among the main functions are:

- Automatic USB connection: the software automatically recognizes and connects to the module when it is inserted into an USB port.
- Real-Time communication: By enabling real-time, all the modifications made in the map are automatically sent to the module, facilitating and speeding the setup.
- Wizard for pedal, throttle and ignition timing calibration: the software has assistants which help and give the necessary steps for the pedal and ignition timing calibration.
- Tools for table manipulation: fill column, fill line, interpolation, add percentage and several other tools, which facilitate the manipulation of fuel injection, ignition and compensation tables.
- Receiving and viewing dataloggers recorded by the module.
- Recording and viewing datalogger in real time.
- Handling multiple datalogger files: the software allows opening several datalogger at the same time.
- Calibration of the Two-Step Control through a datalogger: the software has a tool which draws the start control on a datalogger graphic, facilitating the calibration of this control.
- These and many other functions that will be described in the following sections.

21 HOME SCREEN

The Picture 1 shows the software home screen with a module connected. In this screen it is possible to see the toolbars on top and the status bar at the bottom. In the central part of the screen, it is possible to see the main functions that can be performed using the software. Notice that in the picture there are 6 enumerated regions, and each of these regions is described in the Table 1.
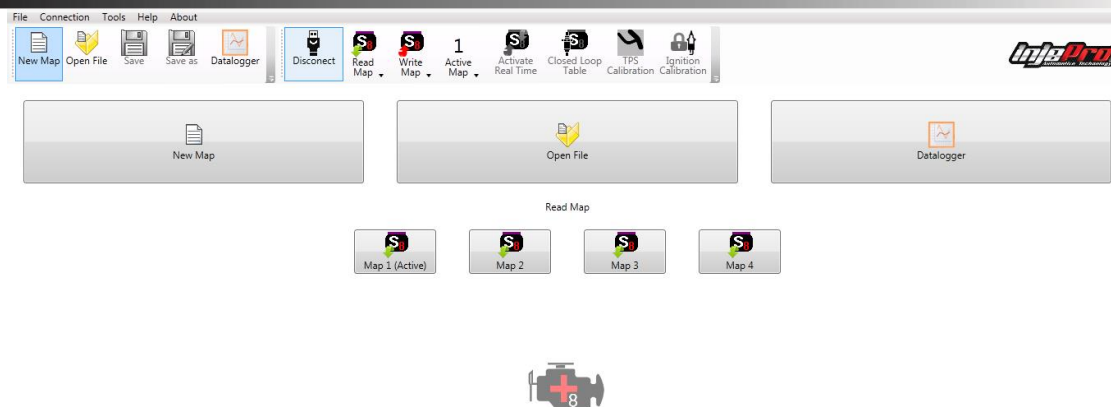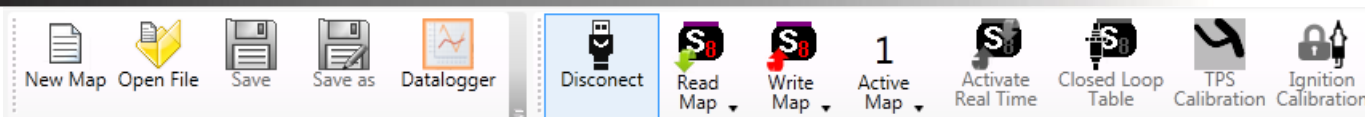
Picture 1 – Home Screen

Nº	Name	Description
1	**Menu and Toolbar**	**Menu with all software functions and the bar where are the buttons with the most used functions.**
2	**Status Bar and Messages**	**Bar which shows the connection state, the connected module version, and the messages with the results from the actions performed in software.**
3	**New Map**	**Create a new map with the standard values.**
4	**Open Map**	**Open a map that is saved in a file.**
5	**Datalogger**	**Open the window to datalogger handling.**
6	**Receive Map**	**Receive one of 4 maps from the module's memory.**

Table 1 – Home Screen Functions

The module has 4 positions of memory to maps, and each button from region 6 can be used to receive one of these maps. Only one of these maps is active in the module, dictating its operation. The first button from region 6 ("Map 1 (Active)") indicates that map 1 is the active map at the moment. It is also possible to visualize which map is active by the button "Active Map" presented in the toolbar (region 1) in upper part from the software window. The number appearing on this button indicates the active map.

22 MENU AND TOOLBAR

In this bar are presented the buttons with the most used and important functions. The picture below shows this bar in details, and next is explained the function of each of these buttons.

22.1 New Map
Shortcut: "Ctrl + N"

This button, as the button "New Map" in home screen central part, initiates the map assistant.

Attention, when creating a map through this function, it is necessary to send the map to the module and then calibrate the pedal and the sensors, in order to the module correctly work.

22.2 Open Map
Shortcut: "Ctrl + O"

This button open a map saved in a file, the same function that the ''Open Map'' button in home screen central part.

This function will always seek the maps that are in the default maps folder. This folder can be configured in the Software Settings. Go to section Software Setting to see how this configuration is done.

22.3 Save
Shortcut: "Ctrl + S"

This button saves in a file the changes made in the map. If the map has been opened from a file, the changes will be saved in the same file; otherwise it will be asked the file name and the folder where to save the file.

This button is enabled only if a map is opened.

The folder that the software opens to save the map is always the default maps folder. Go to section Software Setting to have more information about this folder.

22.4 Save as
Save the changes made in the map in a new file. It is used to create a copy of a map file.

This button is enabled only if a map is opened.

The same as the function "Save", this function also opens the "default maps folder" to save. The section Software Settings has more details about this folder.

22.5 Datalogger
Open a datalogger window, which has a new toolbar focused on the handling of dataloggers. This screen will be showed in the section Datalogger Screen.

22.6 Connect and Disconnect
If the module is not connected, this button is used to request connection to the module, if it is connected, it requests disconnection.

Because the software automatically connects, it also serves as a display of connection status, because its status is updated when the software connects (also see the section Status Bar).

Caution, due to the wide variety of computers on which the software can be installed, there may be situations in which some incompatibility do not allow that the software connect to the module. If the module is not connecting, contact the INJEPRO to verify the problem.
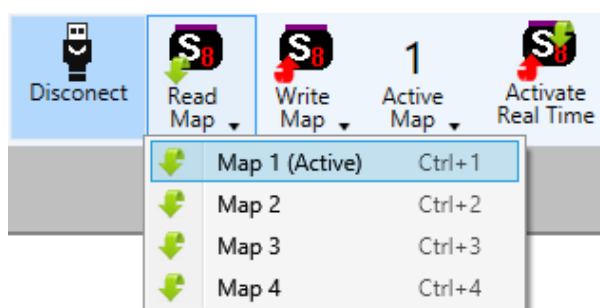
22.7 Read Map
Shortcut: "Ctrl + Map Number"

This button has a menu (picture 3) with the options of which map is wanted. The option that has the red background and the title written (Active) indicates which the active map in the module is.

The options will only be active if the module is connected to the software.

This function has as a shortcut, the key "Control" (Ctrl) plus the map number. For example the combination "Ctrl + 2" reads the Map 2.

A special shortcut is the "Ctrl + 0", this shortcut receive the active map, regardless of which map it is.

Picture 3 'Read Map''

22.8 Write Map
Shortcut: "Shift + Map Number".

This button also has a menu (Picture 4) which allows choosing in which memory position it will be sent the map (Map 1, 2, 3 or 4). As well as the menu of the button "Read Map", the option that has the red background and the title written (Active) is the option of the active map.

The options will only be active if the module is connected to the software.

This function has as a shortcut, the key "Alt" plus the map number. For example the combination "Alt + 4"   will write the current map to the position 4 in module.

The shortcut "Alt + 0" is a special shortcut which writes the current map to the active one of the module, regardless of the position it is.



Picture 1-Button "Write Map"

22.9   Active Map
Shortcut: "Shift + Map Number"

This button serves both to show which active map it is, and to change the active map of the module.

The number showed in the button is the active map (Picture 5). In the Options menu, the active map is also showed with the symbol "✓" beside of the corresponding option. In cases of changing the active map, just click in the wanted option.

 If the module is disconnected, it will be showed a "–" instead of the number and the options will be disabled.

 This function has as a shortcut the key "Shift" plus the map number which is wanted to activate. For example the combination "Shift + 1" will activate the map 1.
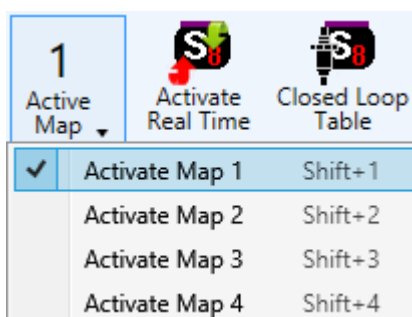
Picture 4 – Button "Active Map"

22.10 Enable/Disable Real Time
Shortcut: "Ctrl + T"

This button is used to enable and disable the Real Time. With the Real Time active, the variations done in the map will be automatically sent to the module, and it is also activated the value reading of sensors and actuators of the module. These values are showed in the tab "Continuous Mode".

This button is able only if the module is connected and it has received the active map of module. This is necessary because the real–time demands a synchronism between the software and the module, causing what is being shown by the software is what is running in the module. And the map that dictates the operation of the module is the active one.

In the section "Continuous Mode", this tab is best detailed. Moreover, in the section Real-Time, the real time is completely explained.

22.11 Closed Loop Table
This button serves to get from the module the map with the compensation percentages done through the module's closed loop compensation. This function will be detailed in the section Closed Loop Compensation.

This function is enabled only with the module connected.

22.12 Pedal Calibration
This button activates the assistant of the pedal and throttle calibration. This assistant helps with a step by step to calibrate the pedal, and if is being used, the throttle. This assistant was showed previously at TPS calibration.

The module needs to be 12V supplied to the correct sensor calibration.

22.13 Ignition Calibration

This button activates the ignition timing calibration assistant. This assistant helps with a step by step to calibrate the ignition timing. This assistant also was showed previously.

This tool, as the Pedal Calibration, is also enabled only with the connected module and the real time active and 12V supplied.

22.14 Menu Files

This menu has some functions related to the files or the software itself. The picture 5 shows this menu.
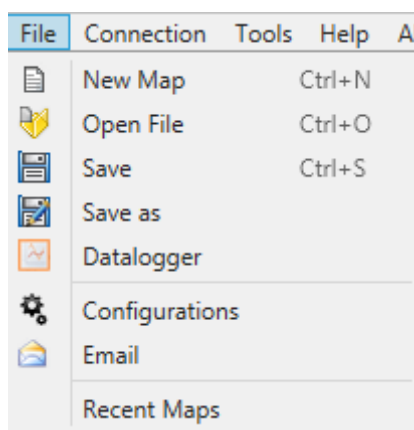
Picture 5- Menu Files

22.14.1 New Map

The same function as the button of the same name at the tool bar. See the section "New Map" for more information.

22.14.2 Open Map

The same function as the button "Open Map" at the tool bar. See the section "Open Map" for more details.

22.14.3 Save

The same function as the button "Save" at the tool bar. See the section "Save" for more details.

22.14.4 Save as

The same function as the button "Save as" at the tool bar. See the section "Save as" for more details.

22.14.5 Datalogger

This button opens the screen datalogger as the button "Datalogger" at the tool bar. See the section "Datalogger" for more details.

22.14.6 Settings

It opens the software settings screen. See the section "Software Settings" for details about the available configurations.

22.14.7 Email

It opens the email sending screen. This screen has the purpose of help in the sending of the e-mail with maps and datalogger inbox for the assistants of INJEPRO. See the section "Email" for details about the use of this function.

22.14.8 Recent Maps
It contains a list with the latest 10 maps opened in the software. Clicking in one item of this list, the corresponding map is opened. It serves as a quickly way in opening the last maps in which were worked on.

22.15 Connection Menu
This menu has the functions that demand connection with the module to be used. The picture 6 shows this menu opened.

Below is the explanation of each function.
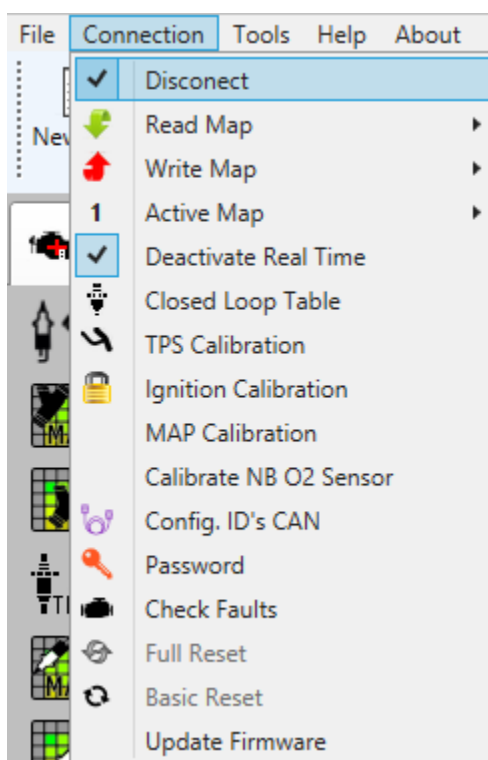
Picture 6 – Connection Menu

22.16 Connect/Disconnect
Same function as the button to connect and disconnect that exists at the tool bar. For more information, see the section "Connect/Disconnect".

22.16.1 Read Map
Function to read a map from the module. It has 4 options, one for each position of module's memory. In addition, has the same shortcut ("Ctrl + Map Number").

See the section "Receive Map" for more information.

22.16.2 Write Map
Function to write the current map to the module. It has 4 options, one for each position of module memory. In addition, has the same shortcut ("Alt + Map Number").

See the section "Send Map" for more details.

22.16.3 Active Map

Function to change the active map in the module. It has 4 options, one for each module map, and has the same shortcut ("Shift + Map Number"). See the section "Active Map" for details.

22.16.4 Enable/Disable Real-time

Button that enable or disable the real time. It has as a shortcut "Ctrl + T". See the section "Real Time" for more information.

22.16.5 Closed Loop Compensation Table

It gets the closed loop table calculated by the module when the closed loop compensation is activated. See the section "Other Functions" to see how to activate this compensation, and the section "Closed Loop" Compensation for more information.

22.16.6 Pedal Calibration

This button opens the pedal calibration assistant, as the button Pedal Calibration in the tool bar.

22.16.7 Ignition Timing Calibration

This button opens the ignition timing calibration wizard.

22.16.8 MAP Calibration

This button opens the MAP Calibration wizard. Read the section MAP CALIBRATION for more information.

22.16.9 NB O2 Sensor Calibration

This button opens the NB O2 Sensor Calibration wizard. Read the section NARROW BAND O2 SENSOR CALIBRATION for more information.

22.16.10 Config ID's CAN

This button opens the wizard for configuration of the ID of the CAN devices. Read the section CAN DEVICES ID SETUP for more details.

22.16.11 Password

Allows to setup the access password of the module. This password is used to read and write maps. When the password is activated, by requesting to read map, the software requests the password, and only when it matches it will read the map. Read the section S8000 PASSWORDS SETUP for details.

22.16.12 Full Reset

This button returns the module to the factory defaults. It is necessary to be careful in using this function, because it cannot be undone, causing the loss of all of the 4 maps from the memory. Before reset the module, save all the maps.

This button is enabled only when the module is connected and the real time is disabled.

22.16.13 Basic Reset

This button resets the internal parameters of the module, without resetting the maps. Use this command to calibrate the MAP without loosing the maps, or to recover from a corrupted internal parameters.

22.16.14 Update the Module

It opens the screen of updating module, which serves to update the firmware of the module S8000.

See the section Updating Module S8000 to know how to update the module.

22.17 Tools Menu

This menu has tools to handle the fuel injection, ignition and compensation tables. The section Operations on the Map shows how to use each of these functions. Except the Automap which is explained in the section "Automap".
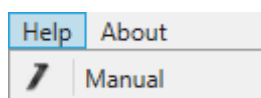
The Picture 7 shows this menu.
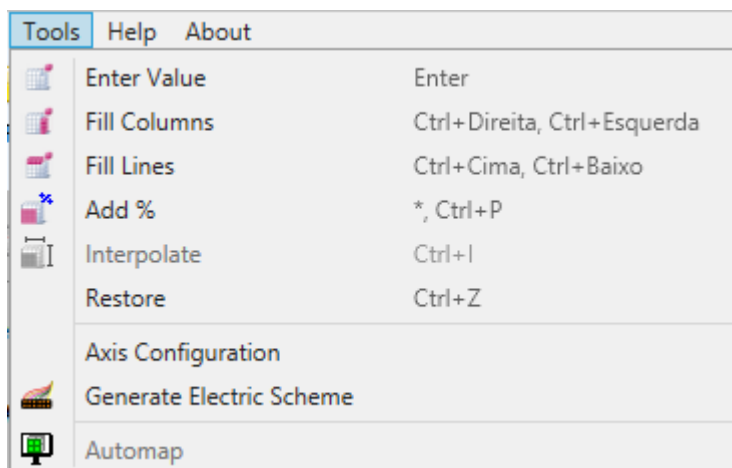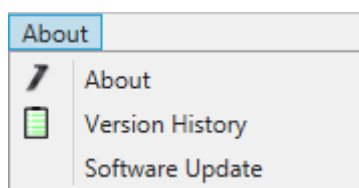

Picture 7 – Tool Menu

22.18 Help Menu

This menu (Picture 8) has an option to open the module/software manual.

Picture 8- Help Menu

22.19 Menu About

This menu (Picture 9) has an option to open the window with information about the software and the. It also has an option to require software updates.

Picture 9- Menu About

23 STATUS BAR

The status bar shows the connection status and some messages that are results of actions performed in software such as: Connected/Disconnected Module, Map Read, Map Sent, Dataloggers Received, etc. It also allows visualizing the history log of these messages.

When the module is connected, the status bar shows this module version.

The picture 10 shows the status bar with the module connected and showing the module's version.

The button with a clock icon, in the left part of the status bar shows a window with the history log of messages. This window can be seen in Picture 11.
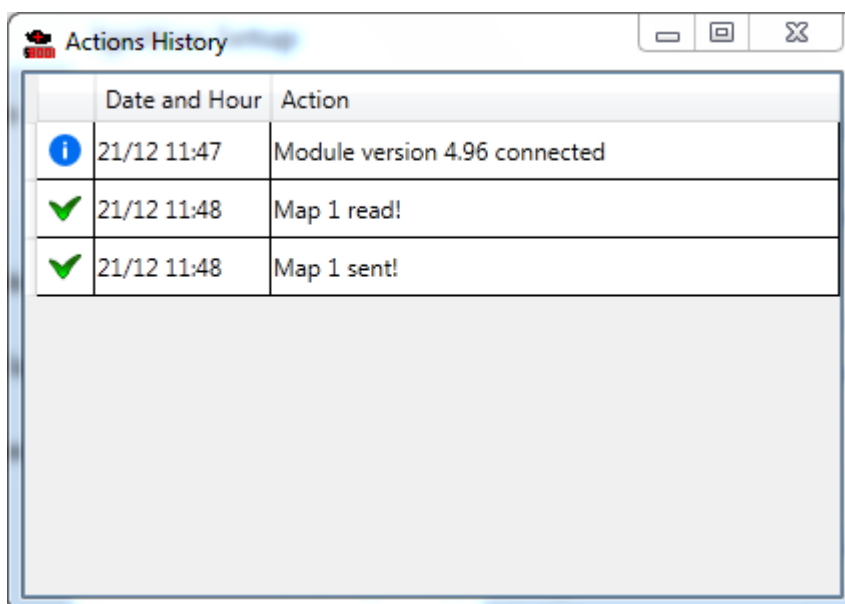
Picture 11- Historic Actions

24 MAPS SCREEN

By creating, opening or receiving a map the software changes to the maps screen. This screen can be seen in Picture 12. The tool bar and the status bar remains in the same place, only the tool bar enable some buttons with functions that can be applied in the map.

In Picture 12 it can be seen, below of the tool bar, the tabs "Map" and "Continuous Mode". The tab "Map" contains the parameters fields of the map, and the tab "Continuous Mode" shows a numeric dashboard with the module's sensors and actuators data, in order to the Continuous Mode be enable it is necessary that the real time is activated.

These two tabs will be explained ahead.

24.1 Map
In the left part of the tab "Map" are showed other tabs. These tabs consist of parameters groups, these groups are created according to the function that the parameters play. Each one of these groups will be described ahead.

 At the top right, below the logo INJEPRO, it is possible to see the field "Name", this shows the name of the map. This name is the one that will be showed in the Tune-Up when it will change the active map.

24.1.1 Settings

The Settings tab can be seen in the picture 12. This tab consists in two subgroups: "Ignition Settings" and "Injection Settings".
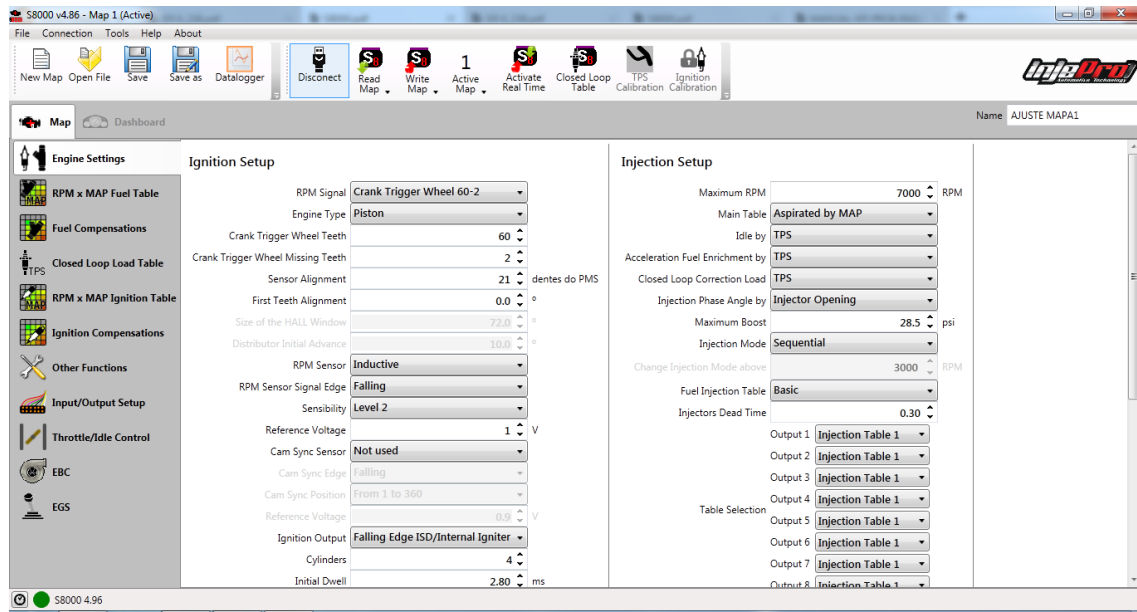
Picture 12- Ignition and Injection Settings

24.1.2 Injection Maps X MAP/TPS

In this tab can be configured the fuel injection times by RPM lines and percentage of TPS or MAP pressure columns.

When working with various RPM lines, it is denominated "Full Map". The parameter "Injection Settings" defines the type of map will be worked. When chosen the full map, the tab will show the table with several lines, as showed in the Picture 13. In full map, is also showed, in the right part, the 3D graph of the table and the 2D graph of the selected line.
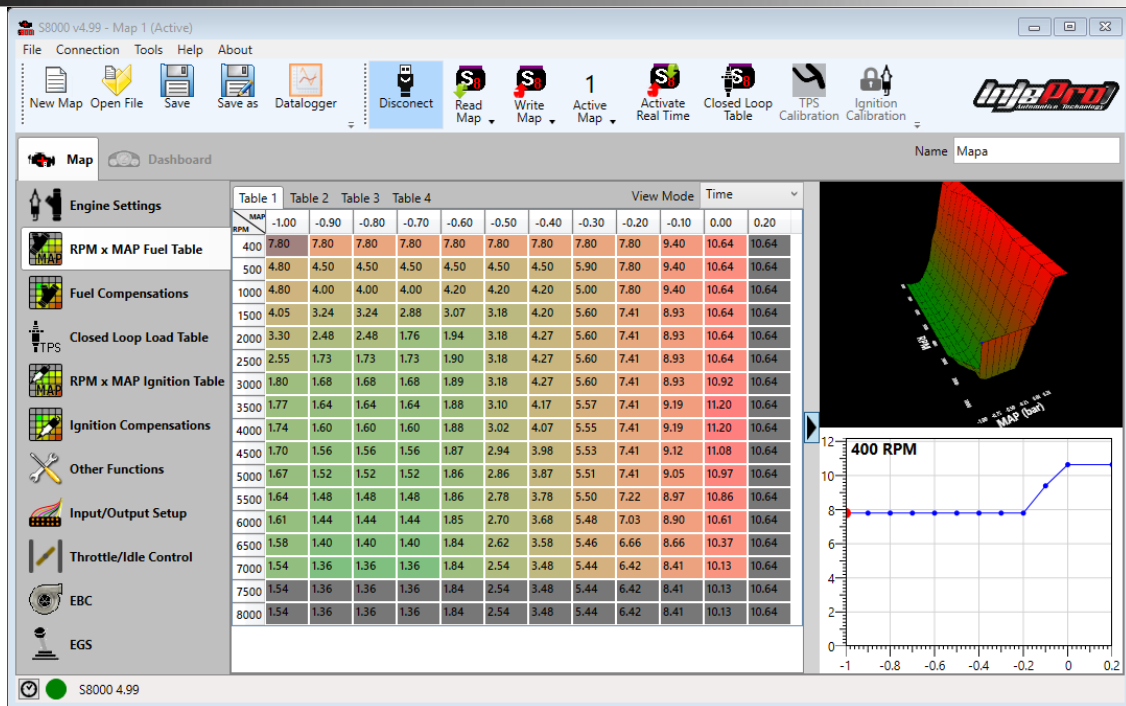
Picture 13 - Complete Map of Injection by MAP

In the full map the lines are controlled by three factors, the first is the scale of RPM (see the section Set Scales), the second one is the parameter "Maximum RPM" (section Settings) and the third one is the parameter "Rev Limiter" (section Other Functions). The value "Maximum RPM" defines the value of last line in the map, and the rotation cells above the "Rev Limiter" are showed with gray background. The picture 14 shows this interaction. By reducing the value of one of these two parameters, the number of map lines decreases in order to keep the map coherent with the module configurations.
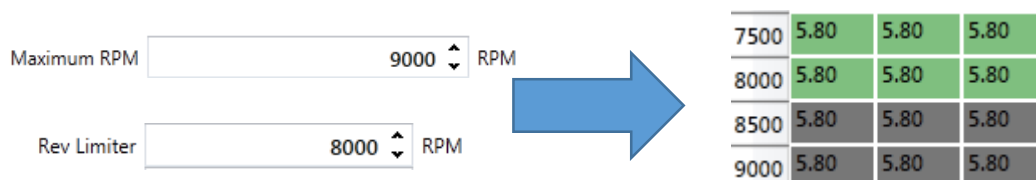
Picture 14 - Interaction between the Maximum Rotation, Rotation Limiter and the Map Lines

When working with basic table, the tab will show only one line in the table, as showed in the picture 15. Below the tab is showed the 2D graph of the same line.
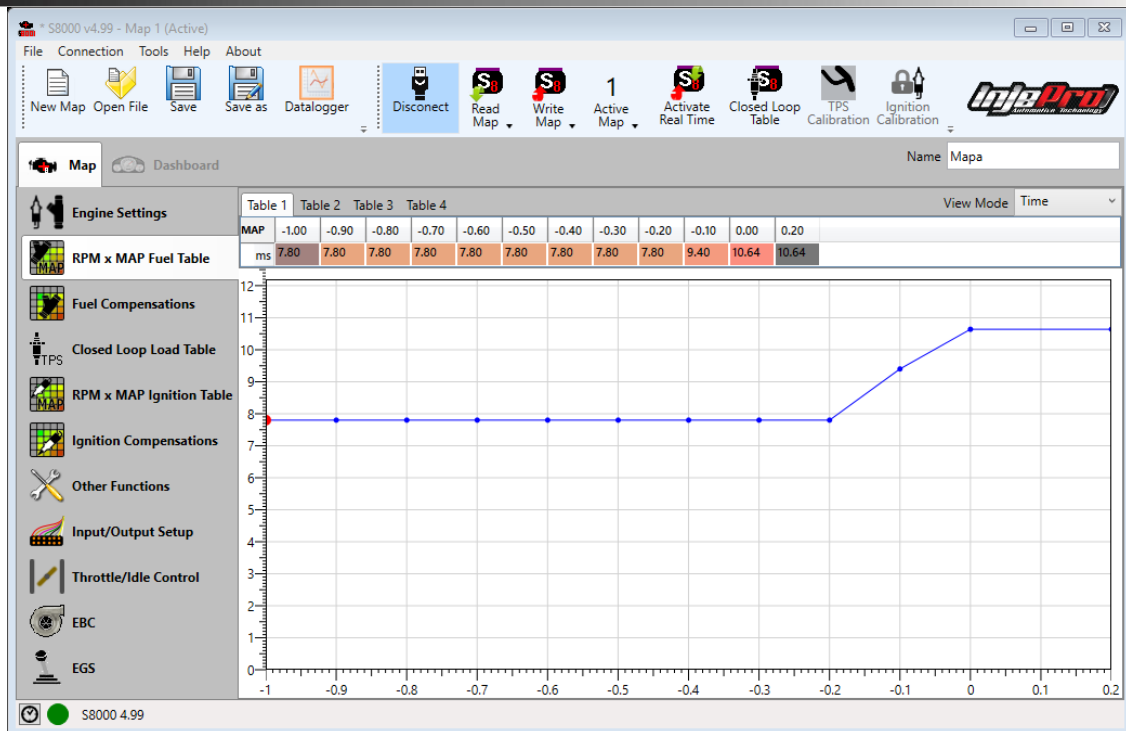
Picture 15 - Basic table of Fuel Injection per MAP

What determines if the columns will be TPS or MAP is the parameter "Main Table" of the "Injection Settings". If chosen "Aspirated by TPS" the columns will be of TPS and the tab will have as a title "RPM X TPS Fuel Table". If chosen "Aspirated by MAP" or "Turbo by MAP", the columns will be of MAP. The difference between these last two is in the columns number. The option "Aspirated by MAP" will show only the columns of negative pressure, in the other hand, the option "Turbo by MAP" will show the columns with pressure values less than or equal to the value inserted in "Maximum Pressure of Turbo" also in "Injection Configurations". The columns number will depend on how is configured the MAP scale. In the section Operations in the Table it is described how to configure this scale and how this will affect the map. The picture 16 shows this interaction.
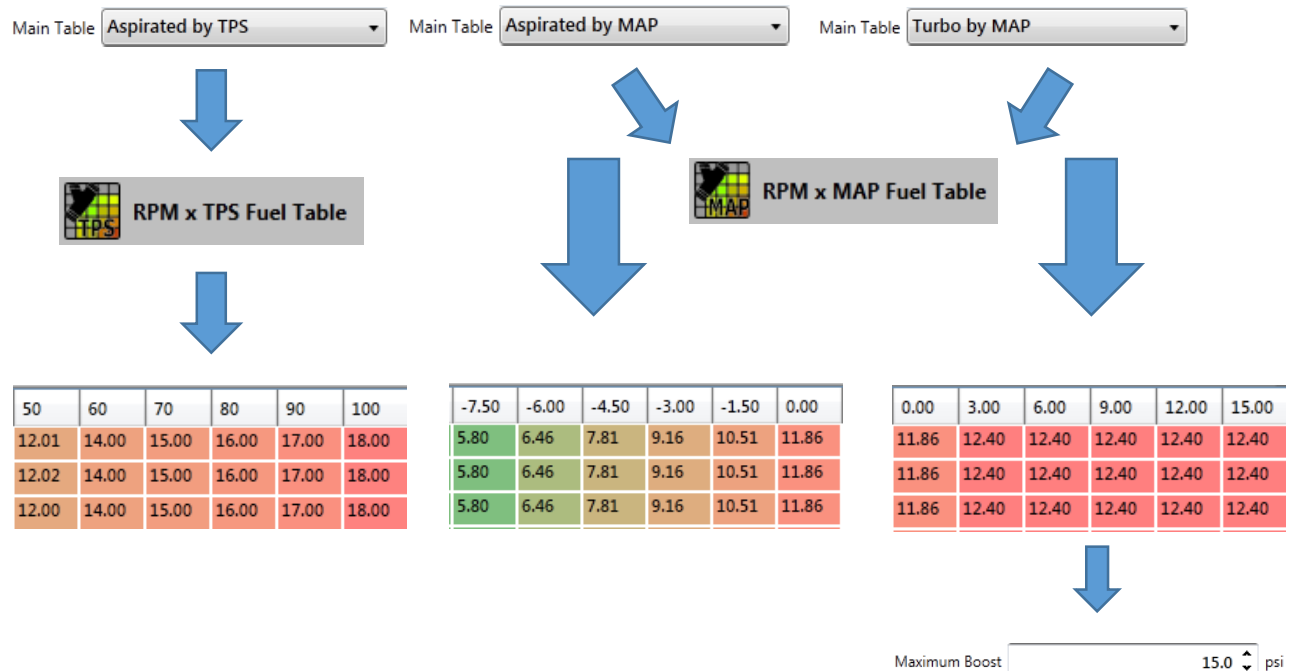
Picture 16- Interaction between the Engine Type, Maximum Pressure of Turbo and the Maps Columns

The value of the cells in this table can be seen either as milliseconds, as injection duty cycle, or degrees of window. The field "View Mode" that is in the upper right corner of the table (see Picture 15) controls this visualization. The "Time" mode shows the table in its normal mode, which is the cells showing the injection time in milliseconds. In the "Duty Cycle" mode, the value shows the corresponding duty cycle of injection. If the table is in full mode, the percentage is calculated based on the RPM of the line in which the cell is. If the table is basic, the percentage is calculated with the maximum RPM of the table (Settings). In the "Window" mode the cells shows the size of the injectors opening window, in degrees. Basically it shows during how much degrees of the engine rotation, in the total of 720º, the injector is injecting. The same way as the "Duty Cycle" mode, if the table is in full mode, the window is calculated based on the RPM of the line in which the cell is. If the table is basic, the window is calculated with the maximum RPM of the table (Settings).

The software checks the fields "Injection Sequence" and "Table Selection" of "Injection Settings" to be able to determinate exactly the value of injection percentage and size of window. The field "Table Selection" determinates which table will be used in each output. If the table does not have any output designated to it, the percentage stays in 0%. When a map has at least one designed output, the software checks in the injection sequence, which injection mode is set for these outputs, then, multiply the percentage according to the pulses number that the output given by engine cycle. For example, if the table is configured as in the section 9.1.1 Example 1, the software understands that the injection mode is sequential, and multiply by 1 the percentages. In the other hand, if the table is configured as the example in the section 9.1.2 Example 2, the software understands that the injection mode is semi-sequential, multiplying the percentages by 2.

Ps. the table cells that appear written in red are cells that passed 100% the use of the injector. Do not confuse it with the cell background. A red background indicates that the value of the cell is close to the highest value of the table, like a heat map.

Four fuel injection tables are available. Each one of these tables is available in a tab at the top of the screen.

The available operations and shortcuts in the tables are described in the section "Operations on the Maps".
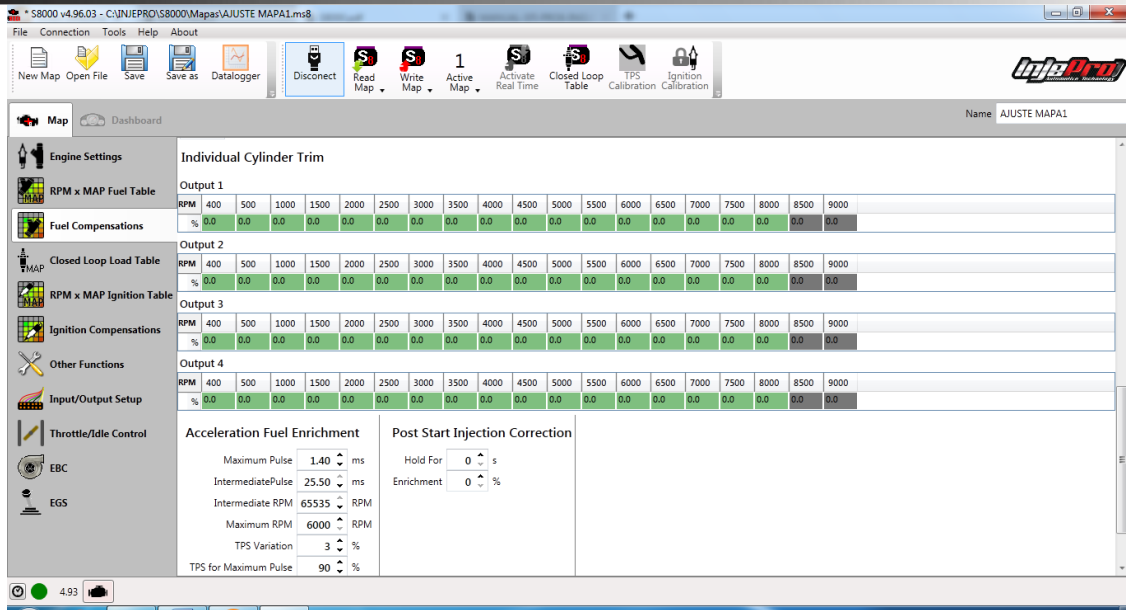
24.1.3 Fuel Compensations

This tab has the compensations that can be done in the fuel injection, based on data from other sensors or specific conditions.

The various maps and parameters of injection compensations are showed in the Picture 17 and 18.
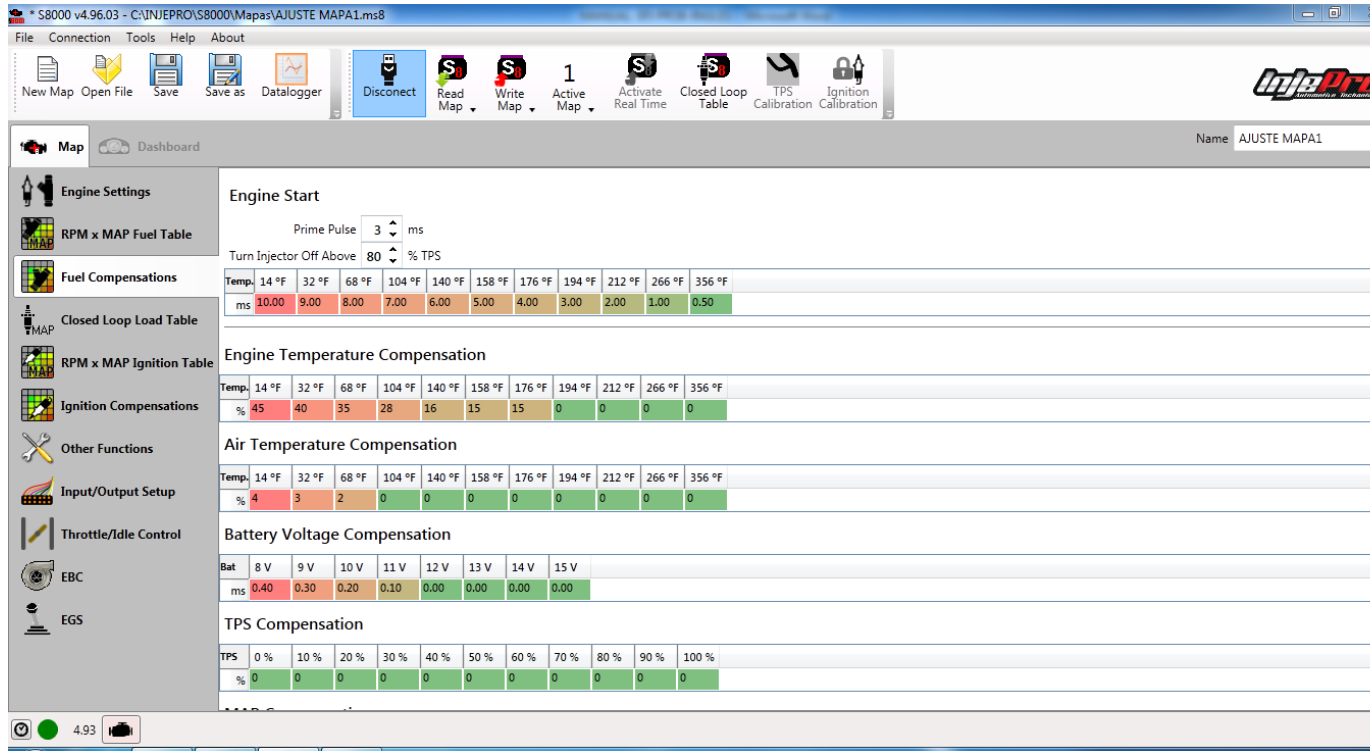
Picture 17- Fuel Compensations Part 1

In the picture 18 it is showed the individuals compensations by injection output. It is important to notice that the individual compensations will be showed only the outputs marked in the table "Injection Sequence" of "Injection Settings". In this table, each column is an output, so it will be showed the output compensations of the columns that have at least one marked cell.

Picture 18- Fuel Compensations Part 2

In the picture 19, it can be seen this interaction. In this picture, if it is market a cell from the output 5 (column 5) or the output 6 (column 6), it would appear the individual compensation table of these outputs.
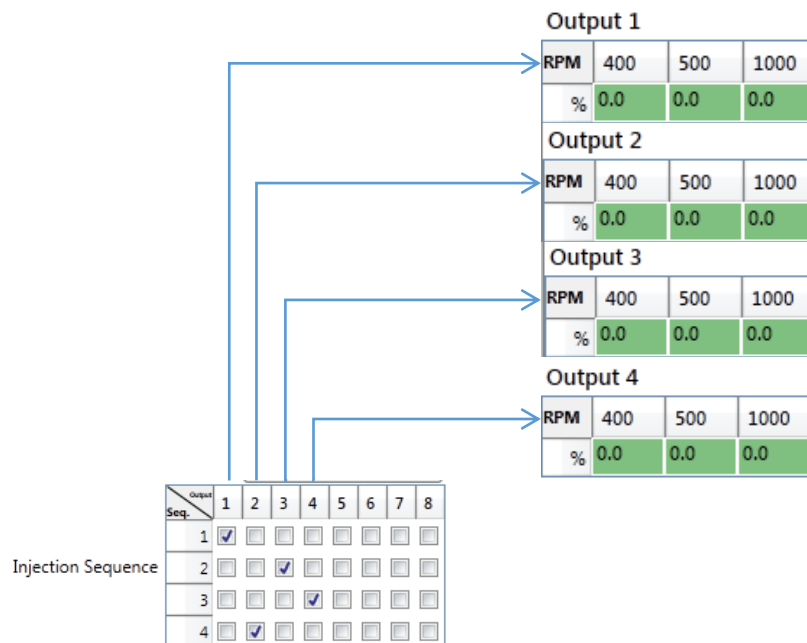
Picture 19- Interaction between the Injection Sequence and the individual compensations

24.1.4 Camshaft Control

The module INJEPRO S8000 can use the maps 3 or 4 of fuel injection as PWM percentage tables that can be used to a camshaft control. The picture 20 shows these PWM tables. Each cell of these tables is a percentage value.

The map 3 of injection is converted to a PWM table, showing as the map 3 in the tab "Camshaft Control" when one of the outputs is set as "Camshaft Control PWM 1".

The map 4 of injection is converted to a PWM table, showing as the map 4 in the tab "Camshaft Control" when one of the outputs is set as "Camshaft Control PWM 2".
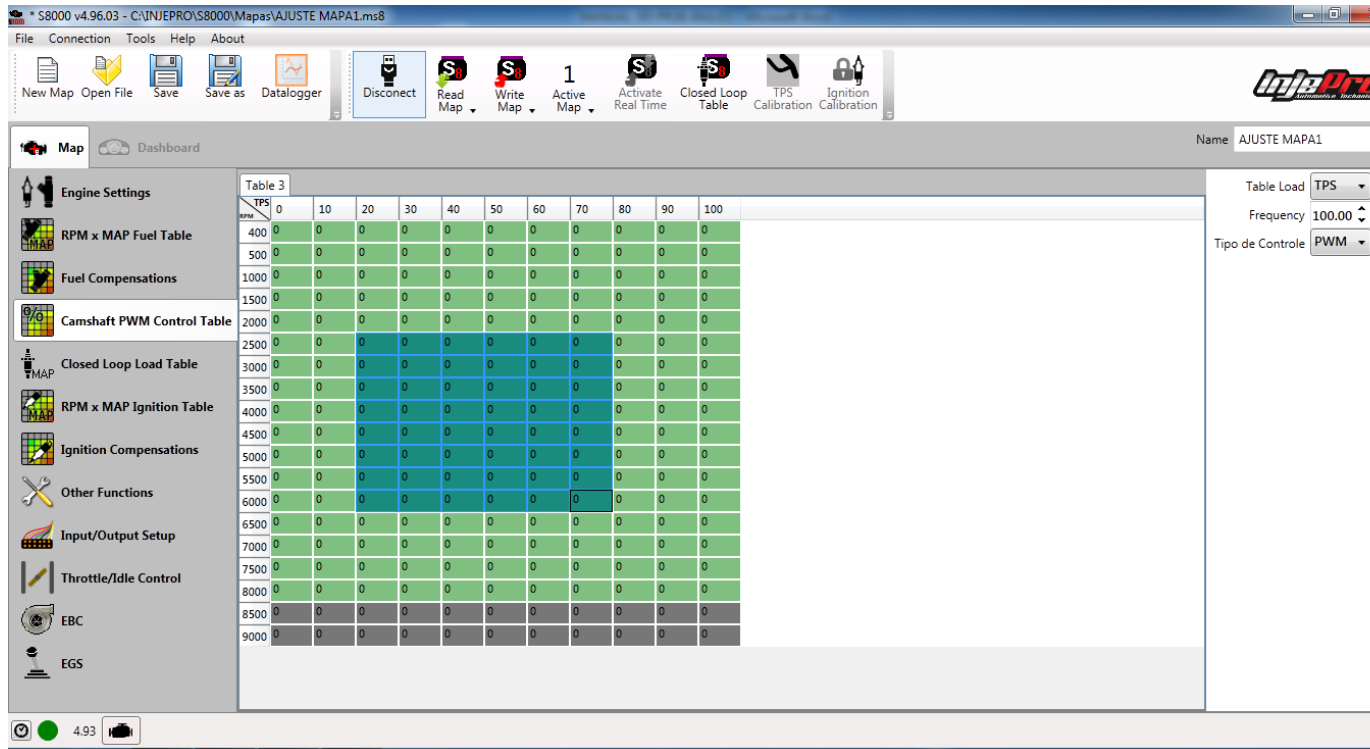
Picture 20 – Camshaft Control.

The picture 21 shows this interaction. It shows the outputs Yellow 3 and 4 configured as the Camshaft Control PWM 1 and 2 respectively. Any one outputs can be configured as Camshaft Control PWM, but it is recommended to use a blue one if it is available.
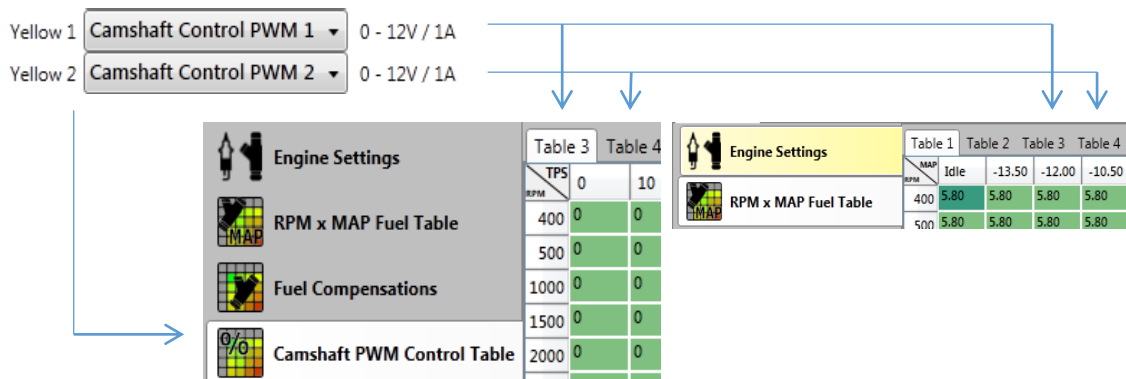
Picture 21 - Maps Interaction of PWM and the Injection with the Outputs settings.

Attention on making this output setup, because the conversion of a map from injection to PWM completely erases it, and this operation cannot be undone. If there is any injection output set to use the table that is being converted, the software will request a new map for that output.

The columns load is controlled by the variable "Table Load", which is located at the right side of the Camshaft Control tab. It is possible to choose between TPS and MAP, indicating if the columns will be of TPS percentage or MAP pressure.

24.1.5   21.1.5 – Closed Loop Load Table

This table has the wanted O_2 sensor value for each RPM and TPS or MAP column.

The values of this table will be those that the module searches when it is compensating the fuel through the O_2 sensor (closed loop). Only if this compensation is active.

The Picture 22 shows an example of full closed loop load table to a wideband sensor.
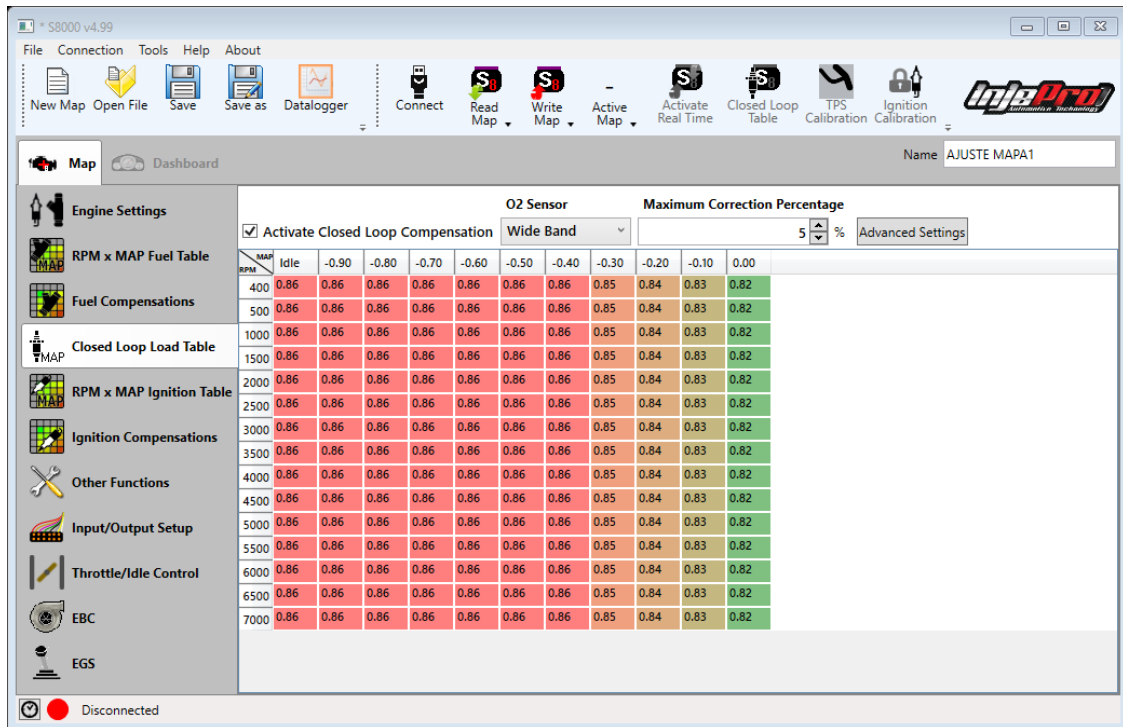
Picture 22- Probe Map by MAP

If the sensor used in the car is a wideband, the values of this map will be in λ (lambda) or AFR, depending on the software unit configuration. If the O_2 sensor is a narrowband, the values will be V (volts). The Picture 23 shows this interaction, where in the Wide Band the table is shown as AFR.
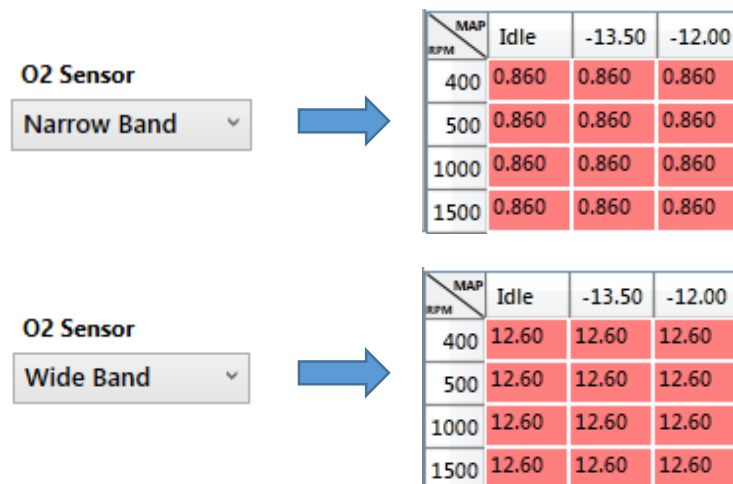
Picture 23- Interaction between the Probe Type and Probe Map values

The parameter "Closed Loop Compensation Load" of "Injection Settings" informs if the columns of this table will be TPS or MAP. The tab title also changes according to the chosen option. Picture 24 shows this interaction.
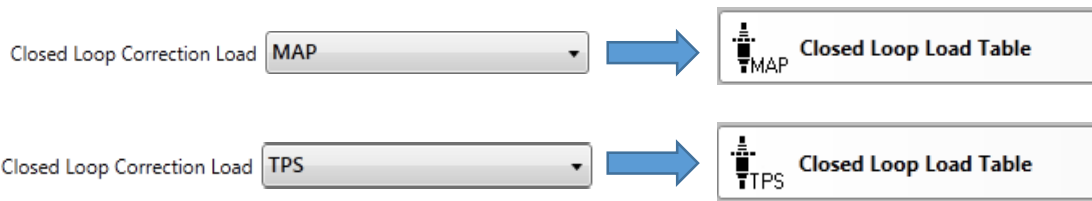
Picture 22 - Interaction between "Closed Loop Compensation Load" and "Closed Loop Load Table"

24.1.6   21.1.6 – RPM x MAP/TPS Ignition Table

In this tab it is possible to set the ignition timing according to the RPM lines and TPS or MAP columns. The columns load, as well as in the fuel injection tables, obey the parameters "Main Table" and "Maximum Turbo Pressure" both of the "Injection Settings".

The Picture 23 shows the screen of the full ignition table. In this picture the 3D and graphs are hidden, but they can be shown clicking in the arrow in the right of the screen. The 3D and 2D graphs have the same behavior of their fuel injection peers.

The Picture 24 shows the basic ignition timing table, with the 2D graph below the table.

The parameter "Ignition Table" of "Ignition Settings" determinates if the ignition map will be full or basic.

It is important to observe that in the basic ignition timing table, the columns are RPM values and it is not MAP or TPS as in the full map.
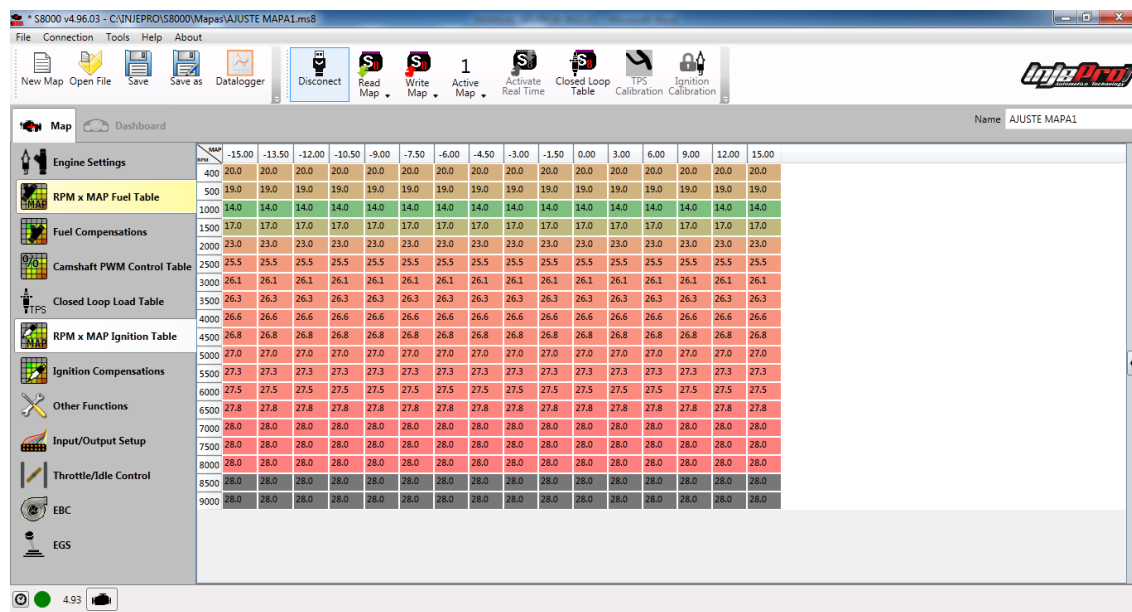
Picture 23- Complete Map OF Ignition by MAP
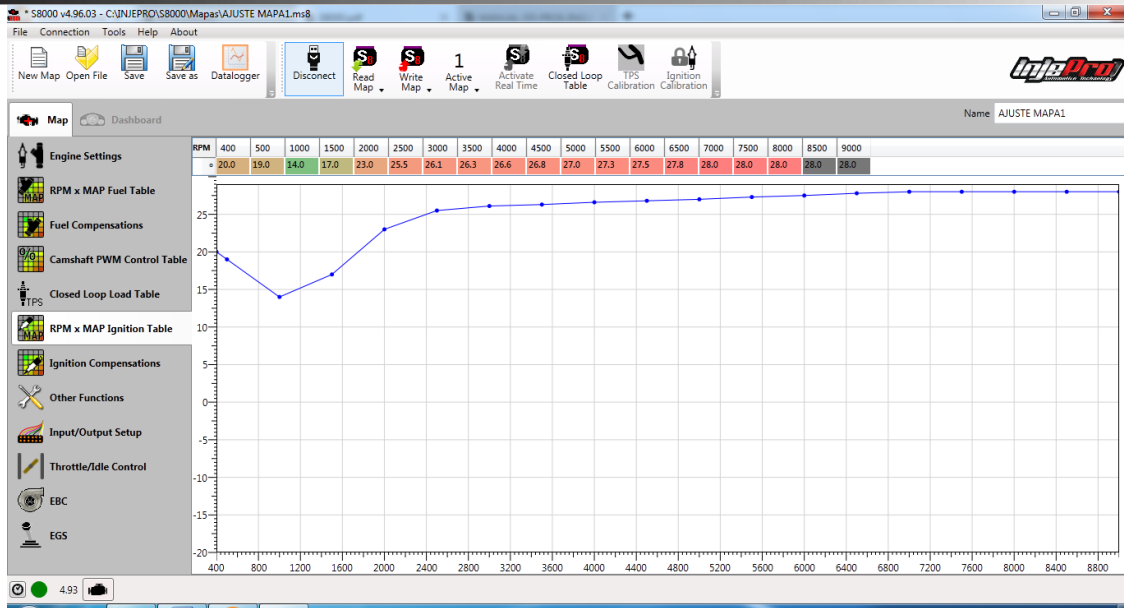
Picture 24- Simplified Map of Ignition by MAP

24.1.7   121.1.7 – Ignition Compensations

In this tab can be found the various ignition compensations, which can be done based on others data sensors.

As well as in the individuals compensations by injection output, only appears the individuals compensations of ignition outputs which have at least one marked cell in its columns, but now in the table "Ignition Sequence" of "Ignition Settings".

The Picture 25 shows the first part of the compensations and the Picture 26 shows the individuals compensations.
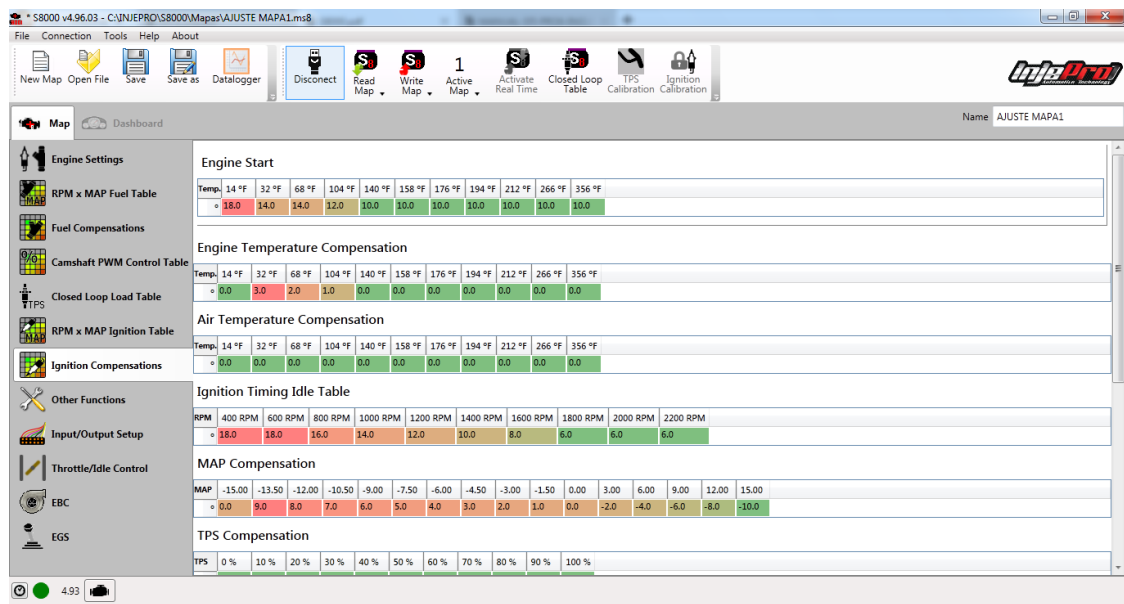
Picture 25- Ignition Compensations Part 1
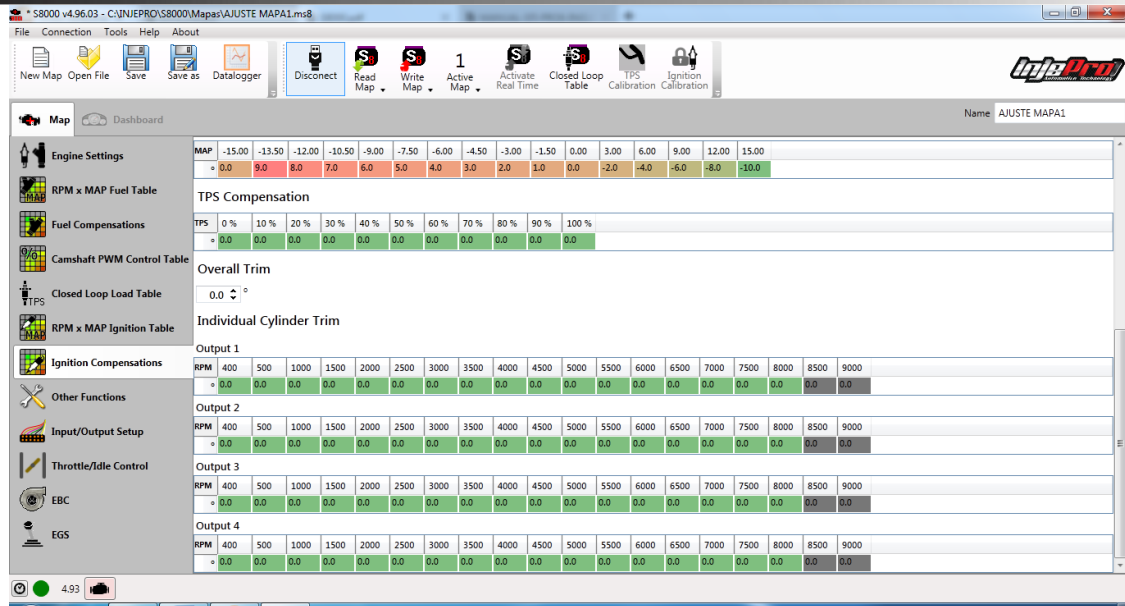
Picture 26- Ignition Compensations Part 2

24.1.8 21.1.8 – Other Functions

In this tab are found the complementary functions of module as: Booster Control, Nitrous, Start Control, and many others.

The pictures below show all function screens that there is at tab "Other Functions".
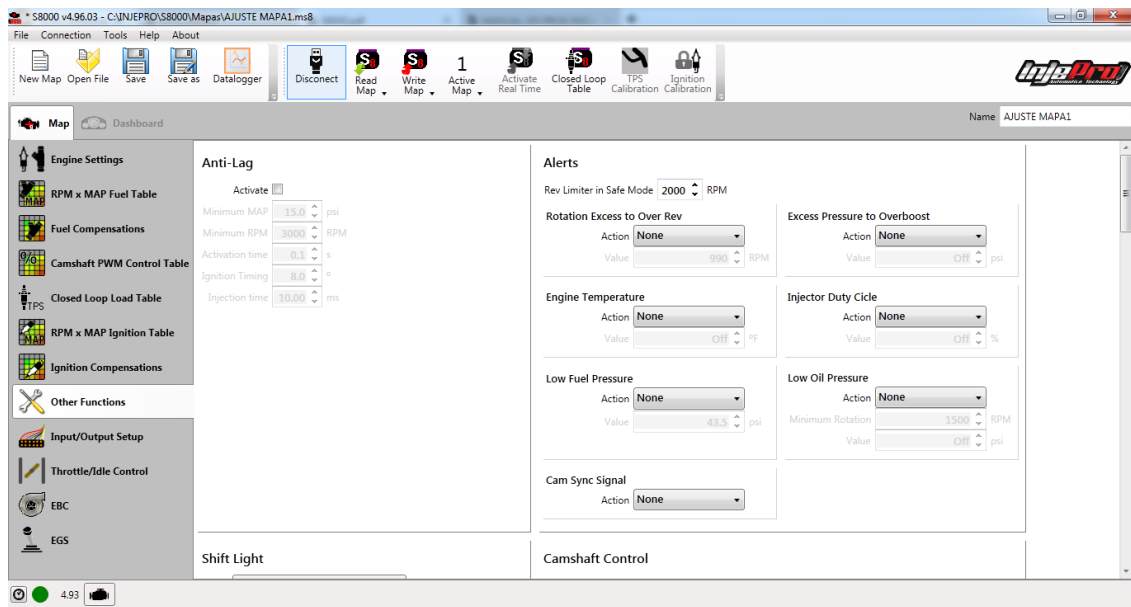
Screen 1 — S8000 v4.96.03 - C:\INJEPRO\S8000\Mapas\AJUSTE MAPA1.ms8

Menu: File | Connection | Tools | Help | About

Toolbar: New Map | Open File | Save | Save as | Datalogger | Disconnect | Read Map | Write Map | 1 Active Map | Activate Real Time | Closed Loop Table | TPS Calibration | Ignition Calibration

Tabs: Map | Dashboard — Name: AJUSTE MAPA1

Sidebar: Engine Settings | RPM x MAP Fuel Table | Fuel Compensations | Camshaft PWM Control Table | Closed Loop Load Table | RPM x MAP Ignition Table | Ignition Compensations | Other Functions | Input/Output Setup | Throttle/Idle Control | EBC | EGS

Shift Light
Mode: Normal
RPM: 6000

	Stage 1	Stage 2	Stage 3
RPM	6000	6100	6200

	Stage 4	Stage 5	Stage 6
RPM	6300	6400	6500

Camshaft Control
Normal
Activate with: 6000 RPM
Minimum TPS: 10 %
Drive Mode: Normal
PWM
Frequency: 100.00 Hz

Boost Control
Mode: Deactivated
Drive Mode: Target Pressure

	Stage 1	Stage 2	Stage 3
Pressure	Off psi	Off psi	Off
Time	0.1 s	0.1 s	0.1
RPM	1000	1000	1000

Nitrous Control
Ignition Timing Compensation: 0.0 °
Fuel Compensation: 0 %

Traction Control by Ignition Timing   Burnout Control

4.93

Screen 2 — S8000 v4.96.03 - C:\INJEPRO\S8000\Mapas\AJUSTE MAPA1.ms8

Traction Control by Ignition Timing
Mode: Time
Fuel Compensation: 10 %
RPM variation in gear shift: 100
Variation time: 200 ms

	Stage 1	Stage 2	Stage 3
Time	1.0 s	4.0 s	14.0 s
Timing	1.5 °	1.0 °	0.5 °

	Stage 4	Stage 5
Time	24.0 s	34.0 s
Timing	0.0 °	0.5 °

Two Step Control
3-Step
RPM of the control: 6000 RPM
Ignition Timing: Off °
Fuel Compensation: 0 %
Target Pressure: 4.5 psi

Burnout Control
RPM of the control: 3000 RPM
Ignition Timing: 21.0 °
Fuel Compensation: 0 %
Activate Corrections: 0 RPM antes
Minimum TPS to Activate Corrections: 50 %
Rev Limiter Burnout: 6000 RPM

Deceleration Cutoff
TPS 0% - Start above: Off RPM
TPS 0% - Start above: 1.3 s

4.93

Screenshot 1:

* S8000 v4.96.03 - C:\INJEPRO\S8000\Mapas\AJUSTE MAPA1.ms8

File Connection Tools Help About

New Map | Open File | Save | Save as | Datalogger | Disconect | Read Map | Write Map | Active Map | Activate Real Time | Closed Loop Table | TPS Calibration | Ignition Calibration

Map | Dashboard
Name: AJUSTE MAPA1

- Engine Settings
- RPM x MAP Fuel Table
- Fuel Compensations
- Camshaft PWM Control Table
- Closed Loop Load Table
- RPM x MAP Ignition Table
- Ignition Compensations
- Other Functions
- Input/Output Setup
- Throttle/Idle Control
- EBC
- EGS

Two Step Control

3-Step
- RPM of the control: 6000 RPM
- Ignition Timing: Off °
- Fuel Compensation: 0 %
- Target Pressure: 4.5 psi

2-Step
- RPM of the control: 3500 RPM
- Ignition Timing: 21.0 °
- Fuel Compensation: 0 %
- Activate Corrections: 0 RPM before
- Minimum TPS to Activate Corrections: 50 %

RPM Control
- Start RPM: 3500 RPM
- Start Time: 1.0 s
- Stage 1 RPM: 6000 RPM
- Stage 1 Time: 3.0 s
- Final RPM: Off RPM

Deceleration Cutoff
- TPS 0% - Start above: Off RPM
- TPS 0% - Start above: 1.3 s

4.93

Screenshot 2:

* S8000 v4.96.03 - C:\INJEPRO\S8000\Mapas\AJUSTE MAPA1.ms8

File Connection Tools Help About

New Map | Open File | Save | Save as | Datalogger | Disconect | Read Map | Write Map | Active Map | Activate Real Time | Closed Loop Table | TPS Calibration | Ignition Calibration

Map | Dashboard
Name: AJUSTE MAPA1

- Engine Settings
- RPM x MAP Fuel Table
- Fuel Compensations
- Camshaft PWM Control Table
- Closed Loop Load Table
- RPM x MAP Ignition Table
- Ignition Compensations
- Other Functions
- Input/Output Setup
- Throttle/Idle Control
- EBC
- EGS

- Total Time: 4.0 s

Additionals
- Compensation After 2-Step: 0 %
- Hold for: 0 s
- Ignition Timing Delay: 100 RPM before
- Ignition Timing Delay: 0.0 °
- Cut Percentage: 100 %
- Start Datalogger
- Start datalogger above: Off RPM
- Turn Engine Off after: Off s

Thermatic fan
- Enrichment with Thermatic Fan On: 0 %

Stage 1
- Activate above: 190 °F
- Deactive below: 181 °F
- Activate with the air conditioner

Stage 2
- Activate above: 212 °F
- Deactive below: 194 °F
- Activate with the air pressure signal

Rev Limiter
- Cut Type: Ignition
- Rev Limiter: 8000 RPM
- Ignition Timing Delay: 100 RPM before
- Ignition Timing Delay: 0.0 °
- Cut Percentage: 100 %

4.93
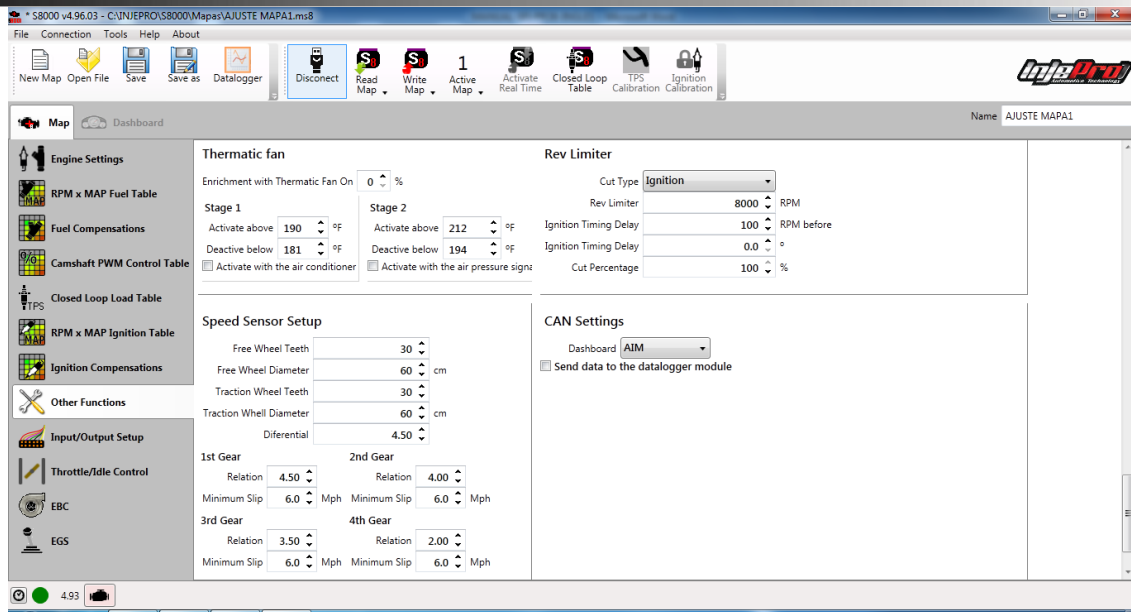
Picture 27- Other Functions

24.1.9   21.1.9 - Inputs/ Outputs settings

In this screen, it is possible to set the module inputs and outputs.

The picture 28 shows this tab. The identifier of each field indicates the wire color of the input or output that it represents.

In the left part it is possible to find the inputs settings, where you insert if an input is connected and what is connected in it.

In the right part it is possible to find the outputs settings, where it is configured if the output is connected and what is connected to it. The Outputs are grouped into three groups: gray, yellow, and blue. Each output has its voltage and current specifications on its side.
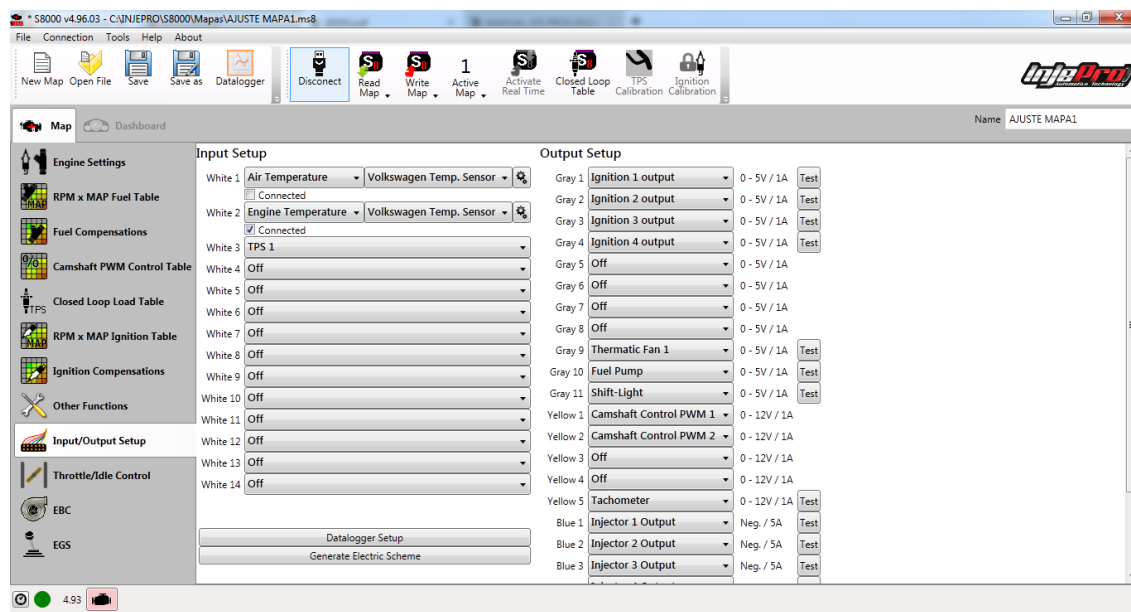
Picture 28 - Inputs and Outputs Settings

Besides that, below the inputs we can see two buttons. These buttons are described below.

24.1.9.1 Datalogger Setup

Clicking in this button you access the datalogger recording setup.

In the S8000 you can configure which channels will be recorded and the record frequency. This way you can improve the use of the internal storage space. It is possible to record up to 80 channels.

This screen have the "Auto Setup" too. This button let the software analyze the entire map to automatically setup the recording. When using this function, remember to, every time you change the inputs and outputs setup, to run it again.
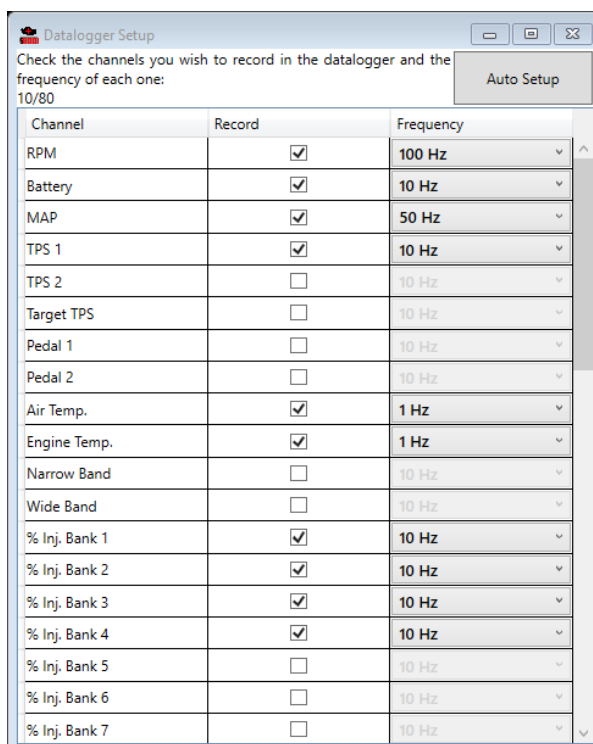
Picture 29 – Datalogger Setup

24.1.9.2 Generate Electric Scheme

This button opens a screen with an electric scheme with S8000 connector and showing what must be connected to each pin/wire. As well as a table with the same information.

Scheme of Connection

Rear view of the harness connector – S8000

Scheme of Connection

Pin	Wire Color	Function
1	Blue n°1	Injector 1 Output
2	Blue n°3	Injector 3 Output
3	Blue n°5	Off
4	Blue n°7	Off
5	Black Thick	Power Ground
6	Gray n°1	Ignition 1 output
7	Gray n°3	Ignition 3 output
8	Gray n°5	Off
9	Gray n°7	Off
10	Gray n°9	Thermatic Fan 2
11	Gray n°10	Off
12	Yellow n°2	Off
13	Yellow n°4	Off
14	Black Thick	Power Ground
15	Red Cable Sensor O2	Pin 6 Sensor O2
16	Amarelo Cabo Sonda	Pin 5 Sensor O2
17	White n° 1	Off
18	White n° 3	Off
19	White n° 5	Off
20	White n° 7	Off
21	White n° 9	Serial RX
22	White n° 11	Off
23	Light Blue	CAN-L
24	White	CAN-H
26	White Cable-knit	RPM
27	Red Cable-knit	RPM Referência
28	Black / White	Signal Ground
29	Black	Power Ground
30	Blue n°2	Injector 2 Output
31	Blue n°4	Injector 4 Output
32	Blue n°6	Off
33	Blue n°8	Off
34	Gray n°2	Ignition 2 output
35	Gray n°4	Ignition 4 output
36	Gray n°6	Off
37	Gray n°8	Thermatic Fan 1
38	Yellow n°5	Tachometer
39	Gray n°11	Off
40	Yellow n°1	Off
41	Yellow n°3	Off
42	Red	Positive Post key
43	Gray Cable Sensor O2	Pin 3 Sensor O2
44	Preto Cabo Sonda	Pin 1 Sensor O2
	Green Cable Sensor 2	Pin 2 Sensor O2

Print out

24.1.10 Throttle/Idle Control

This tab contains the parameters for the electronic throttle control, when it is being used, or the idle control, when using the cable throttle.

24.1.11 EBC

This tab contains the parameters for the control of the integrated EBC. Note that it has two internal tabs. The first one, selected by default, shows the control the stages

of the EBC. The second one shows some additional controls of the EBC, as the traction control as example.

24.1.12 EGS
This tab contains the parameters of the EGS control.
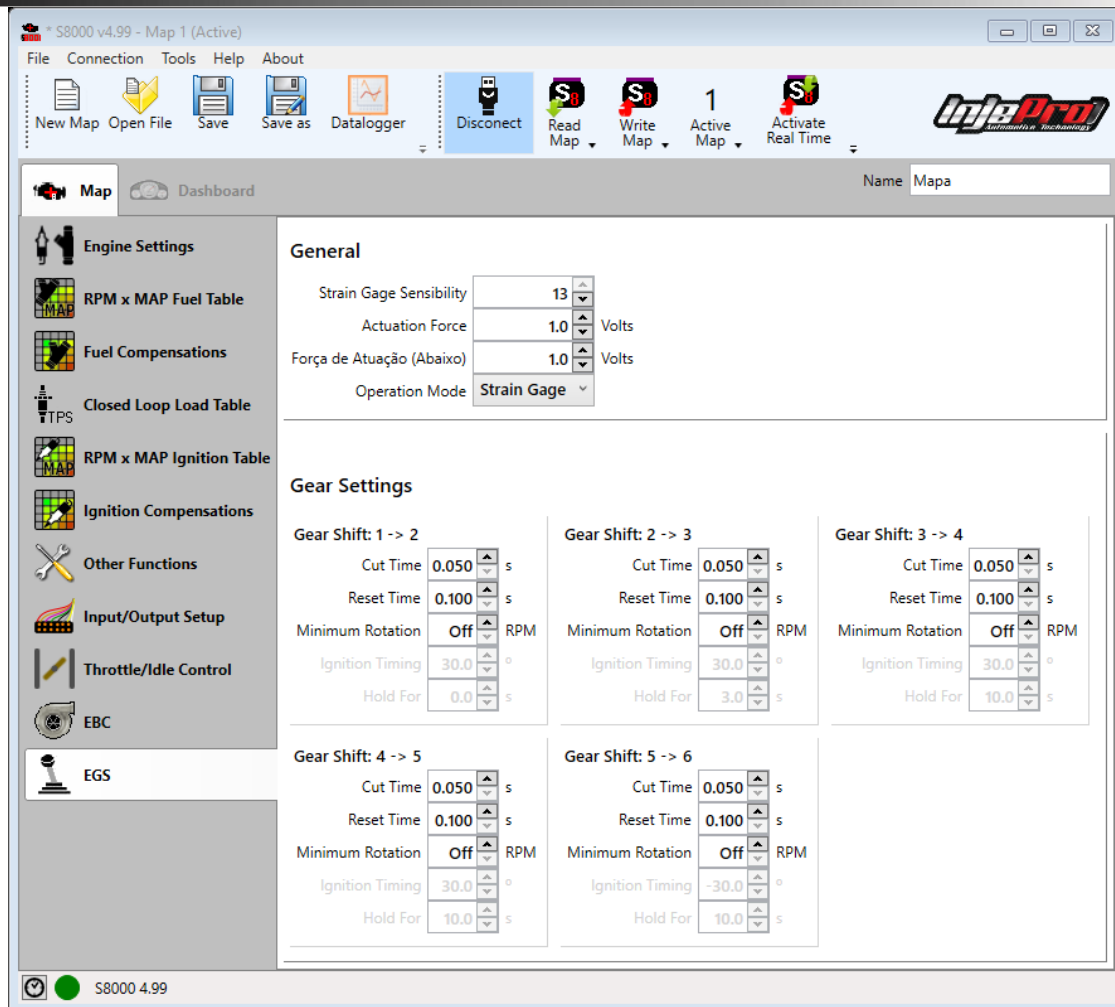
24.2   Dashboard

This is a simple dashboard to check the sensors values and module actuators. In this mode, the information is organized in a way in which the relating data are next to each other.

In order to enable the tab of continuous mode, it is necessary that the real time is active, and to set the real time it is necessary to receive the module's active map.

The Picture 29 shows the dashboard screen.
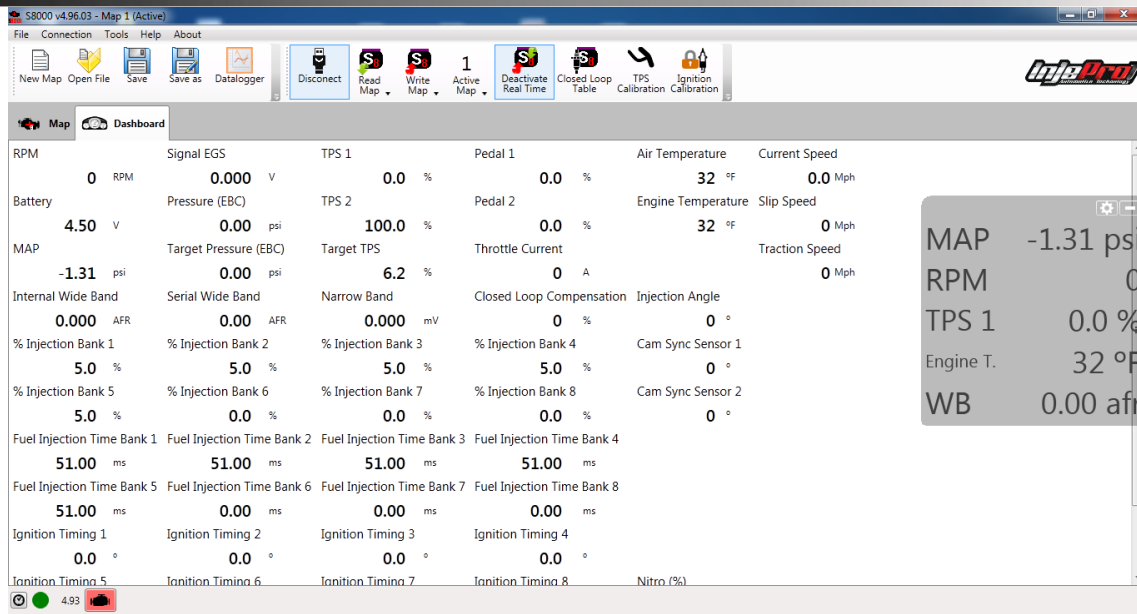
Picture 29- Continuous Mode

The last two lines of the dials corresponding to the external sensors. These sensors are showed according to the inputs settings (see section Inputs/Outputs Settings). In the example of Picture 29, it has the Input I, II, III, IV and V configured as "Analogical 0 – 5 V".

The software has a dedicated function to the analogical inputs, where it is possible to set how these inputs are interpreted. These settings are accessed through the button with gears as icon, beside the channel name.

The picture 30 shows the configuration window.
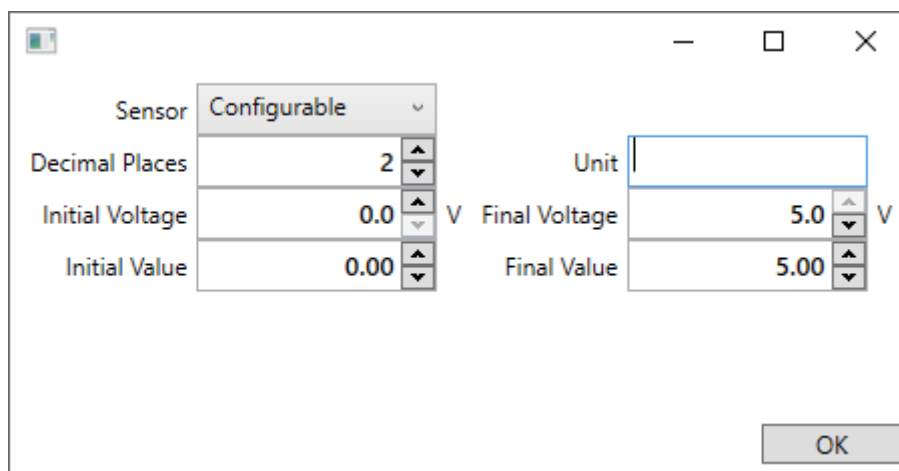
Picture 30- Configuration Analog Input in the continuous mode

If the first field, "Sensor", determines the value conversion. It has the options "None", where the value is showed in pure form, in volts (V), "Configurable" where the unit and interpolation are configurable, and "EGT", that has the conversion of an INJEPRO EGT sensor pre-configured.

When the "Sensor" is "Configurable" the other fields are used to determine the conversion of the channel:

- The field "decimal places" determinates how many places after the comma the value will have.
- The field "Unit" determinates the value unit.
- The fields "Initial Tension", "Final Tension", "Initial Value", and "Final Value" determinate the values to the interpolation which will calculate the input value.

25 DATALOGGERS SCREEN

This screen is accessed through the Datalogger button, in the Tool Bar of Home Screen. This screen is dedicated to the datalogger visualization and handling. The picture 37 shows the data loggers screen with its main regions enumerated. The table 2 described each one of these regions.

Nº	Name	Description
1	**Datalogger Tool Bar**	**Bar with the most important functions when it is working with datalogger.**
2	**File List**	**List where the multiple opened files are.**
3	**Datalogger List of the Module**	**List where the datalogger which are recorded in the module are**
4	**Status Bar**	**Same function of the Status bar of home screen**
5	**Graphical drawing area**	**Area where the datalogger data is drawn.**
6	**Legend**	**Area where it is showed the names, colors and datalogger channels values.**

Table 2 – Screen Data loggers Regions and Functions

This screen allows opening multiple files, these opened files are being inserted in the files list (region 1 Picture 31). Selecting one of these, its graphics are drawn in the region 5 of the screen.

When opening the datalogger screen, if the module is connected, the list of dataloggers that are in the module's memory (region 3) is automatically updated. The same happens if the screen is opened and connects the module.

It is also possible to request to receive the dataloggers, through the button "Read Dataloggers".

The dataloggers that are in the module's memory, each of them is primarily just shown in the list "Module". From there, it is possible to save the datalogger in a file through the button "Save". It is also possible to save all the dataloggers from this list through the button "Save Read Dat.". This button will receive all the module dataloggers and save in the desired folder.

The status bar (region 4) has the same function and details as the status bar of home screen. For more details see the section Status Bar.

The drawing area of the graphics (region 5) has in the upper part, the selected datalogger title and below, the channels lines. It also has a cursor showing the current

instant of the graph, and the values shown in the legend channels (region 6) is the value of the same in this instant.

The legend area (region 6) shows all the channels present in the file. It is showed the name, color and the channels value in the point where it is the cursor in region 5. It is also possible to highlight the channels in graph clicking in the channel name. A highlighted channel has its layout thicker, its legend with the same background color, and its scale appearing in the left part of the graphic.
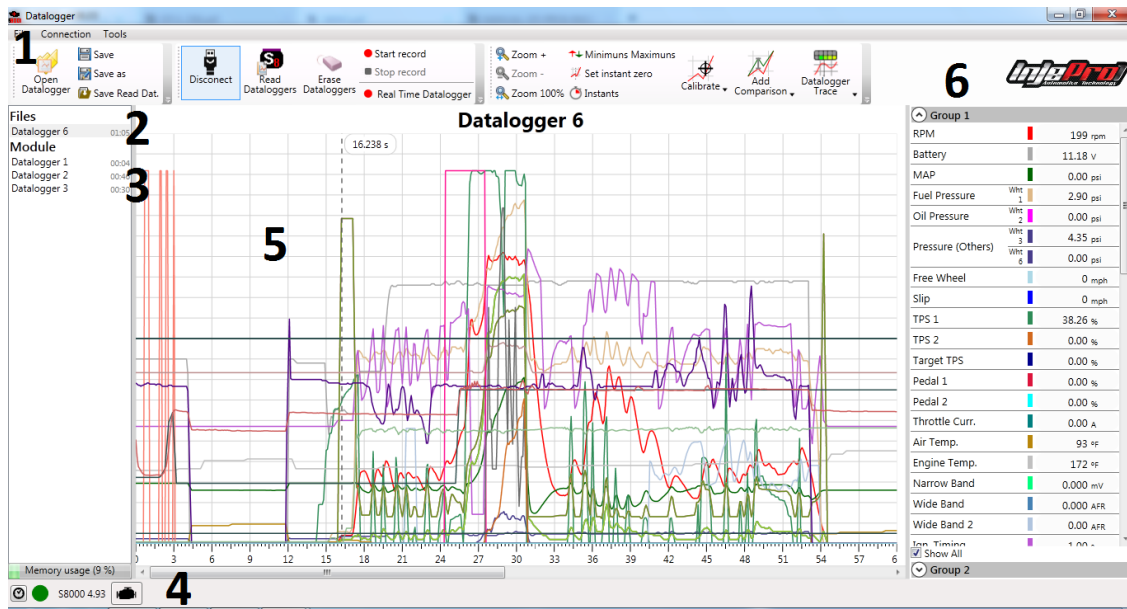
Picture 31- Data loggers Screen with its main functions

In very clear environments, such as race tracks, the datalogger with white background it may be difficult to visualize. For it was created the option of having the graph with dark theme, improving for these cases. The Picture 32 shows the datalogger with this option. For more details see the section Graphic Color.
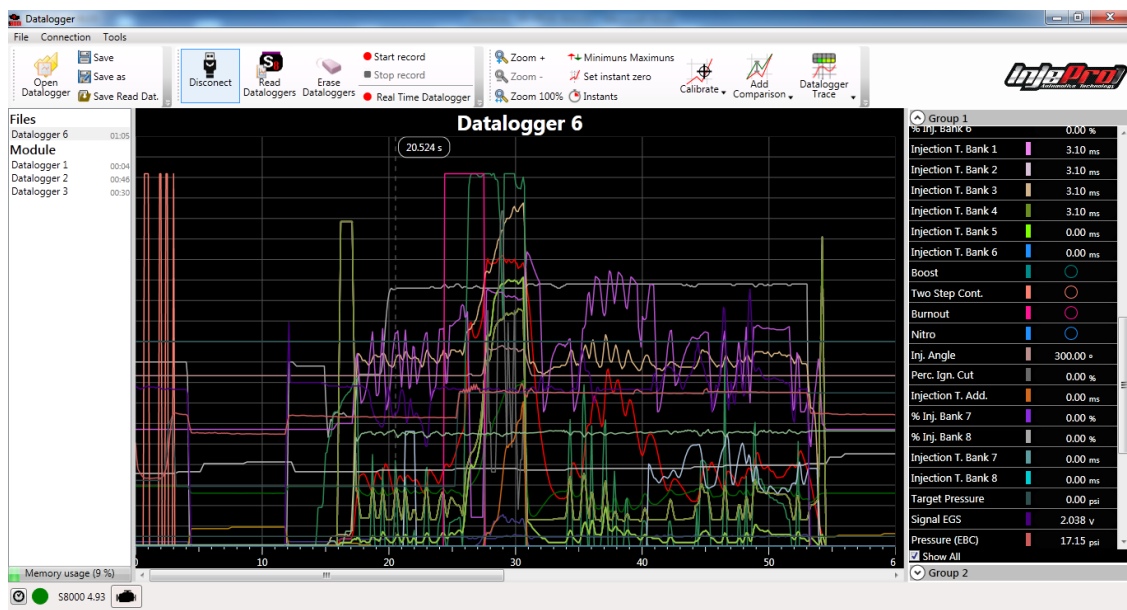
Picture 32- Data logger with dark theme

25.1 Tool Bar

The toolbar of datalogger screen (Picture 33) has the main and most used functions when it is working with dataloggers. Each of these functions is explained below.
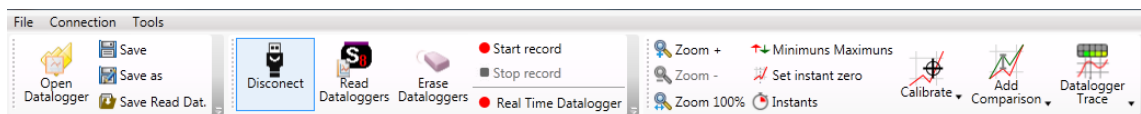
Picture 33- Data loggers Tool Bar

25.1.1 Open Datalogger
Shortcut: "Ctrl + O".

Open a datalogger saved in a file. This file is added to the file list and automatically selected to show its graph.

The software always searches the dataloggers in the default datalogger folder. See the section Software Settings for more information of how to set this folder.

25.1.2 Save
Shortcut: "Ctrl + S"

Save in a file the changes done in a datalogger.

The software always opens the standard datalogger folder to save this file. Go to section Software Settings for more information.

25.1.3 Save as
Save in a file a received datalogger from the module. It also can be used to create a copy of a datalogger file.

In this function, as the function "Save", it also opens the default datalogger folder to save the file. The section Software Settings shows how to set this folder.

25.1.4 Save Read Dataloggers
This button read all the dataloggers from the dataloggers list from the module and save them in a folder. It is a quick way to save all the module dataloggers.

The software opens the default dataloggers folder to create a sub folder where it will be saved the read dataloggers. The section "Software Settings" shows how to set this folder.

25.1.5 Connect/Disconnect
Same function as the button "Connect/Disconnect" from the Home Screen. See the section "Connect/Disconnect" for more details.

25.1.6 Read Dataloggers
Update the module dataloggers list. This button deletes the dataloggers from the list and gets the new list from the module's memory.

This function is automatically called when the datalogger screen is opened and the module is already connected, or when the module is connected and the screen is opened.

25.1.7 Erase Dataloggers
Delete all the dataloggers from the module memory. It is important to be sure when using this function because it cannot be undone.

25.1.8 Real-Time Datalogger
Shortcut: "Ctrl + T"

This function starts the real time module of datalogger. In this mode, the graphic area draws the channels in real time with the module sensors data. After stop the recording, the datalogger can be saved.

The recordings are getting in a new list called "Recordings". This list appears below the list "Module" when recording the first record. The picture 34 shows this list with three records.

Picture 34- Dataloggers list recorded in real time

25.1.9 Start and Stop Recording
These two buttons starts and stops, respectively, a datalogger recording in the module's internal memory. The difference between this function and the Real Time Datalogger is that in this function, the recording is done internally in the module. After stop recording, request the read of dataloggers to update the modules list and see the new record.

25.1.10 Zoom +
Shortcut: "+".

Increases the zoom level of the graphic area, approaching the visible area. The zoom level can be also increased with the key "+" from the keyboard or turning the mouse scroll forward.

The maximum zoom allowed is up to the total visible area being of 1 second. From this point it is not possible to increase the zoom.

25.1.11 Zoom –
Shortcut: "-".

Decreases the zoom level of the graphic area, moving away the visible area. The zoom level can also be decreased with the key "-" from the keyboard or scrolling the mouse scroll button backwards.

The minimum zoom allowed is up to the total visible area being of 1 minute (60 seconds). From this point it is not possible to decrease the zoom.

25.1.12 Zoom 100%
Decrease the zoom level until show the entire graphic or get at least to the minimum allowed (1 min). In graphics with 1 minute or less, it will show the entire graphic, in graphics with more than 1 minute, it will show the maximum allowed.

25.1.13 Color Graphic

This option enables or disables the dark theme of the datalogger (see the Picture 32). This option will be saved making the software resume with the same configuration that was when it was closed.

As seen on picture 31, with this option active, the graphic and legend backgrounds are in black, passing the written to white color. However, it is necessary to be careful because it is not made any operation on the channel color, therefore, if any channel is with black color, it will not be visible in the graphic because of the lack of contrast with the background.

25.1.14 Minimums and Maximums

This option opens a window with the maximums and minimums statistics of each channel. The Picture 35 shows this window.

This window has a table relating the maximums and minimums of each channel. By selecting a statistic, the channel of this statistic is visible, highlighting and showing its scale in the back graphic. It is also drawn a line showing the statistic value and a point in the instant that this value is reached in the channel. The graphic is also translated to show this point right in the center.

It also can be observed statistics information about the channel through the legend. See the section "Legend".

Picture 35 - Minimum and Maximum Window of the datalogger

25.1.15 Reset (Mark Zero)

This option serves to mark the instant of beginning of the graphic. Generally it is intended that this instant is the start. This is why the software by default, when opens a file for the first time, searches for the instant in which the button of Two Step was released, and determinates this as start point.

However, with this function it is possible to determinate any instant of datalogger as the start.

For that, click in the button, notice that by clicking, the mouse cursor is replaced by the format of "+", and then click in the graphic in the intended point to mark the point zero.

It is also possible to access this function clicking with the right button of the mouse in the intended point to be the zero, and choose the option "Reset" (Picture 36).
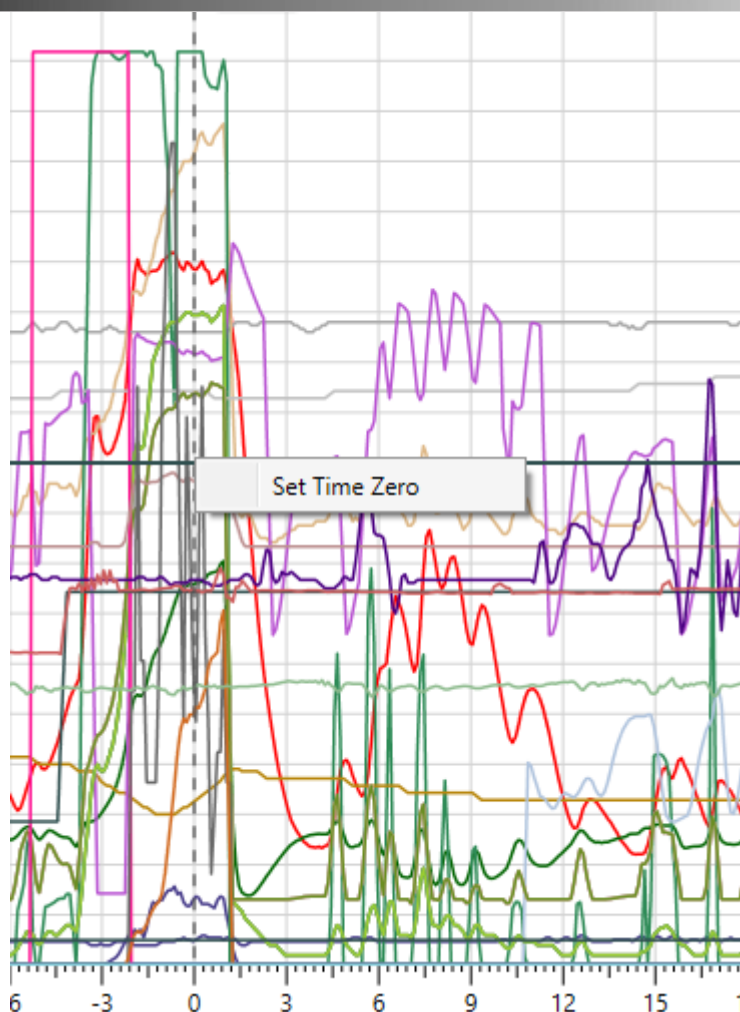
Picture 36 - Alternative form of marking the initial time of data logger

25.1.16 Instants

This button opens the insertion window of instants in the datalogger. This window (Picture 37) is about a table where it is inserted a description of the instant (Description Column) and its instant (Instant Column). The last column (interval) shows the interval between the last instant and the current one, and it is automatically calculated.

These instants are inserted in the graphic as verticals lines in each instant. A text box beside of the line, in the upper part, shows the description and the exactly instant.

Picture 37- Instant Insertion in datalogger

25.1.17 Calibration

Function to make parameters calibrations of the map through the datalogger data. It is possible to calibrate the "traction control" and the "traction control by ignition timing". The Picture 38 shows these options in the tool bar.
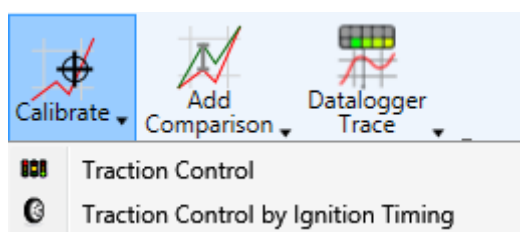
Picture 38 - Calibration Options in the datalogger

25.1.18 Traction Control

Function to calibrate the traction control through the datalogger. In order to this button to be enabled, it is necessary being with the map opened in the maps screen.

Clicking this button a window is opened with the two-step (traction) control parameters and it is drawn in the graphic the four control points. With this it is possible to set the parameters through the fields in the window, or dragging with the mouse the control points.

The synchronization of the new values is immediate, by finishing the calibration just send or save the opened map. As well as, if the real time is activated, the data would already be in the module.

The Picture 39 shows the traction control calibration in datalogger.
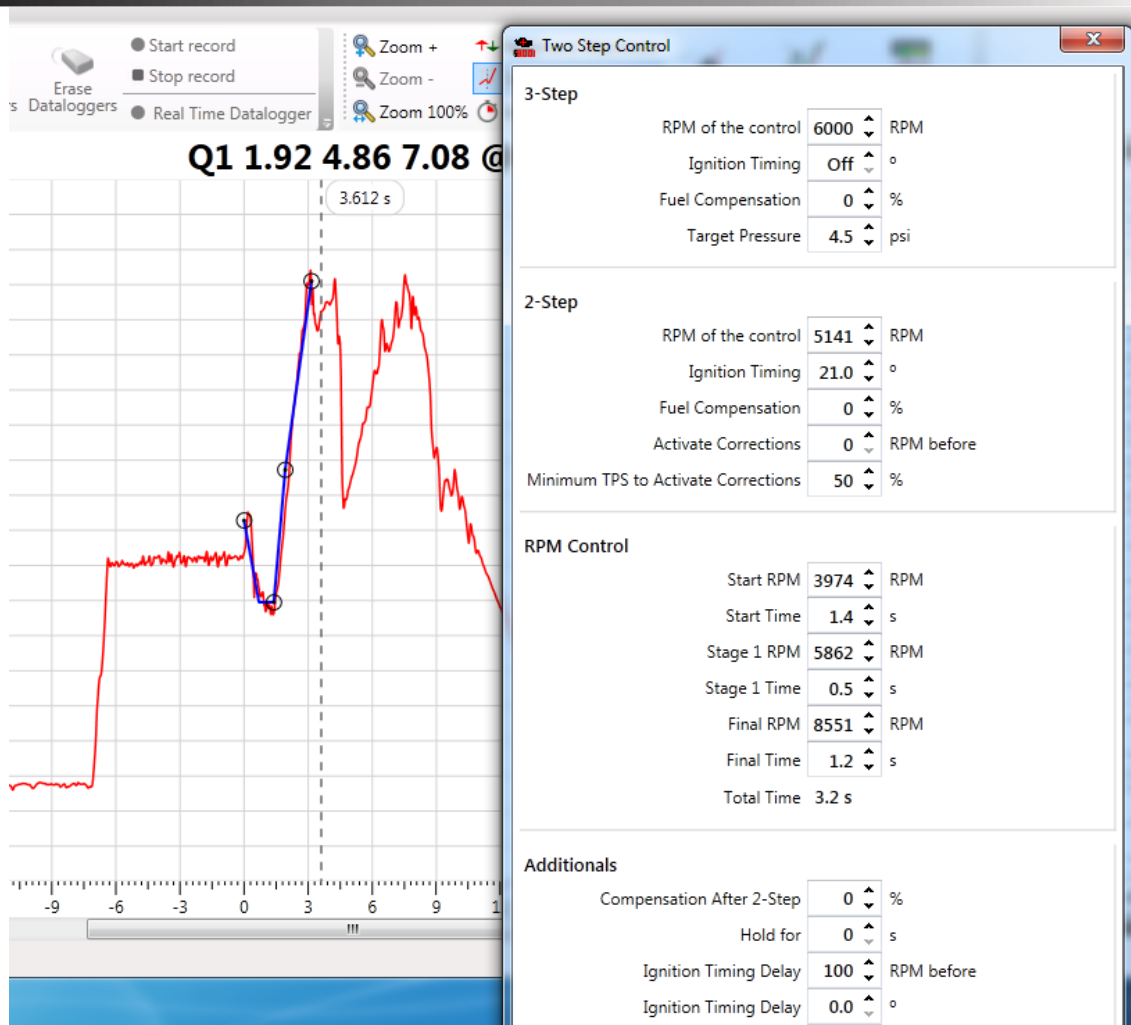
Picture 39- Traction control calibration in datalogger

25.1.19 Traction Control by Ignition Timing

Function to calibrate the traction control by ignition timing in the datalogger. For this button being enabled, it is necessary having the map opened in the maps screen.

Clicking in this button, it is opened a window with the traction control by ignition timing parameters and drawn in the graphic a copy of the ignition timing channel with the control applied. In this new channel will be highlighted the five points of control which represents the five control stages. With this it is possible to set the parameters through the fields in the window, or dragging with the mouse the control points.

The synchronization of the new values is immediate, by finishing the calibration just send or save the opened map. As well as if the real time is active, the data will be in the module.

The Picture 40 shows the calibration of the traction control by ignition timing in the datalogger.
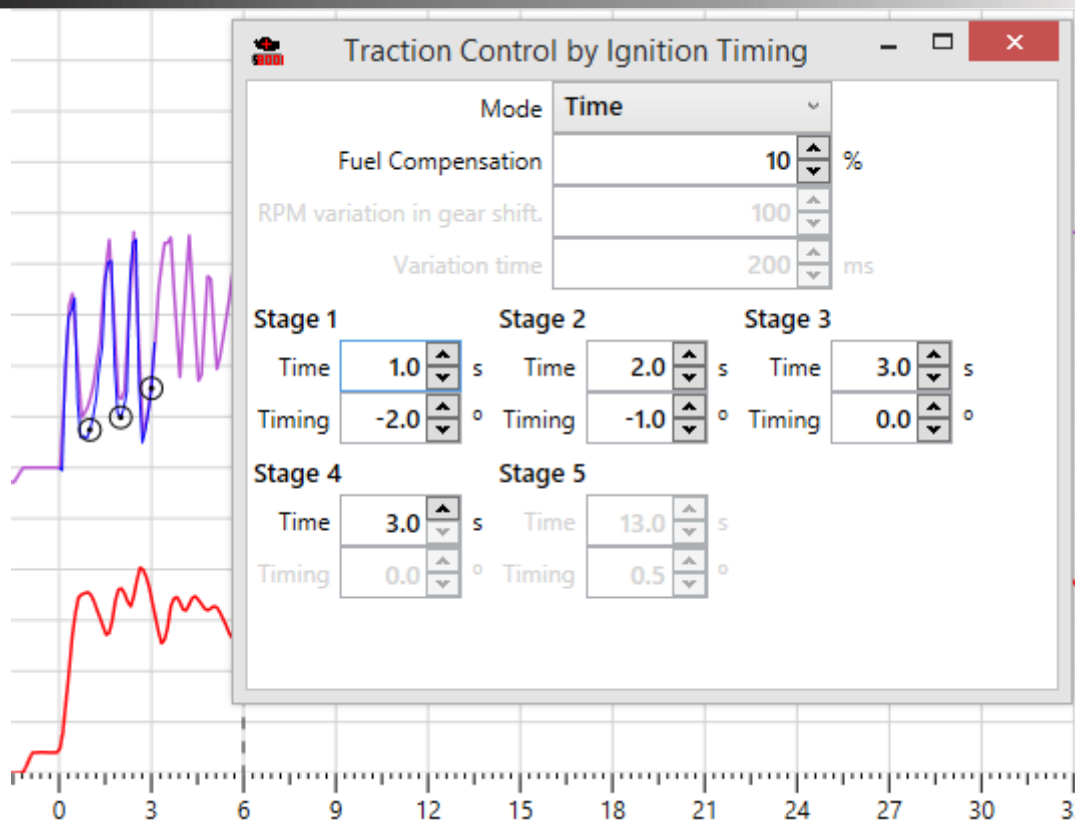
Picture 40- Calibration Traction Control by ignition timing in datalogger

25.1.20 Trace in Datalogger
Function to make the trace (select cells in use in a table) through the data of the datalogger.

This button has a menu with the options of tables in which can be done this trace. The Picture 41 shows this menu.
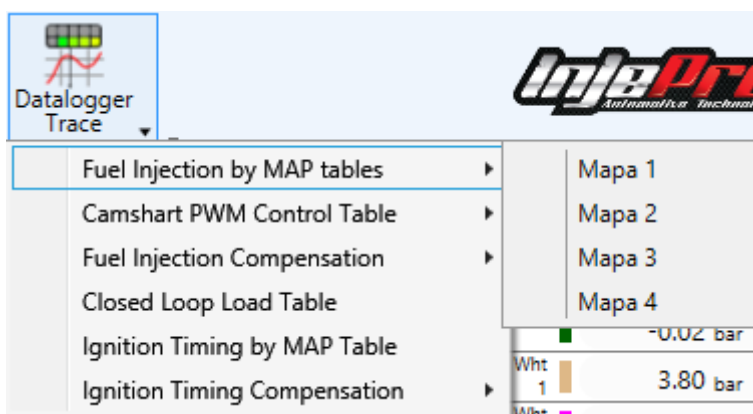
Picture 41 – Trace Options in Data logger

Setting this function, the datalogger screen divides in two horizontally, in the upper part is the map chosen for trace, and in the lower part is the graphic. The Picture 42 shows the screen in this condition.

With this is possible to go through the datalogger with the cursor and see in the table the cells painted in red showing what information were being used at that time.

In order to close the trace, just click in the button "Close" on the top right corner of the map, where it is being done the trace.
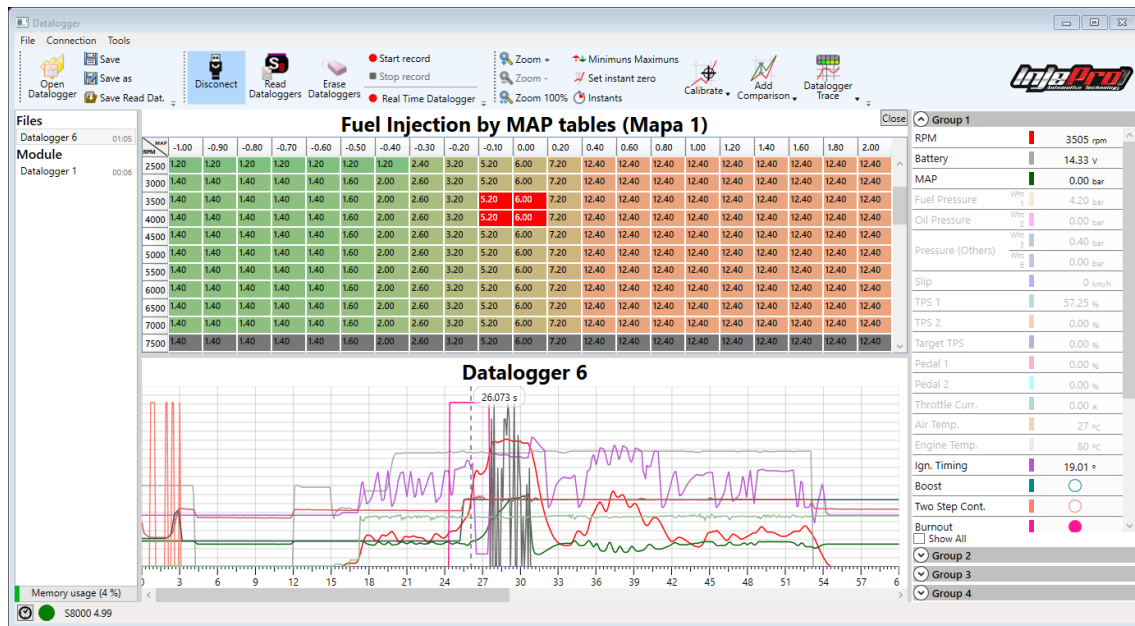
Picture 42- Trace with Data logger

25.2 Legend

The legend is responsible in helping in the identification of the channel in graphic and showing its values, besides, it has some extras functions, as it will be showed below.

In the legend it is possible to group the channels, each group has its own graph, improving the visualization of the many channels the S8000 has.

It is possible through the channel legend to change the color of its line. In the Picture 43, it can be observed the options which appear by clicking in the legend value of a channel, in this case, the RPM.

The first option allows changing the color, the second one allows to increase the line thickness in the graphic.

And right below it can be observed some statistics. The statistics that appear vary according to the selected channel. In this case, shows the maximum that the RPM reached and the range of RPM in which remained more. The way how this range is calculated is configurable, see in the section Software Settings how to configure it.
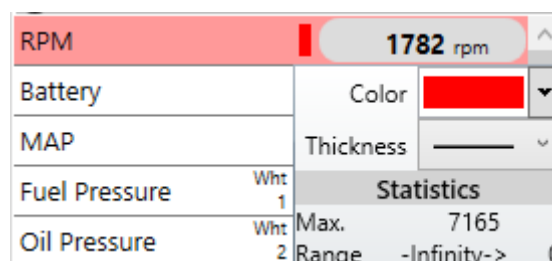
Picture 43- Legend options of the channels

It also have a directly way of changing the channel color. By directly clicking in the rectangle that shows the channel color in the legend, appear colors options, by choosing one of them, the color will be changed (see the Picture 44).
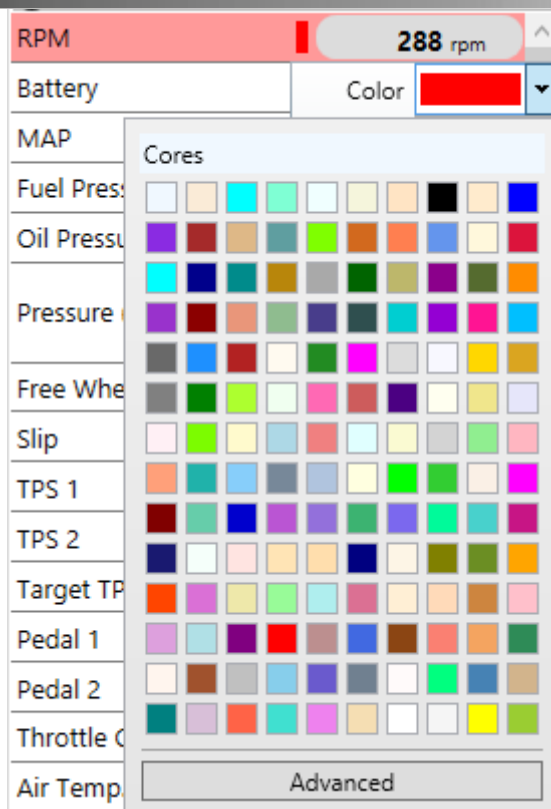
Picture 44 - Color options to the channels

Another available function is the ability of making the channels disappear and appear in the graphic again. For this, just click twice in the channel name. In the Picture 37, it can be verified through the legend, some channels which are not visible as: TPS 2, TPS Target, Pedal 1, Pedal 2, Throttle Curr., and many others. All the channels that are with the faded legend are channels that are not visible in the graphic. Clicking twice these channels become visible again.

This function is important when it is wanted to observe specific channels, enabling remove of the graphic the channels that are confusing the visualization, since the SFI-PRO 6 datalogger has many channels.

Another interesting function involving the legend is when it is wanted to know which channel a line is representing. For this, push the key "Ctrl" and drag the mouse on the wanted line. With this the channel will be highlighted, staying in the legend with its color in the background, allowing to identify the channel.

26 REAL TIME

The real time is one of the functions that most facilitate the setup of the car. When it is activated the changes in the parameters values are sent in the right moment that the value is modified. Its main use is in the setup of the fuel injection tables.

For this, activating the real time, a window is opened showing the current value of the O2 sensor, both narrow band and wide band. The Picture 45 shows this window in the right part. This window is always visible, independent of the tab which is opened. It is also draggable. It can be dragged with the mouse and positioned in the wanted place.
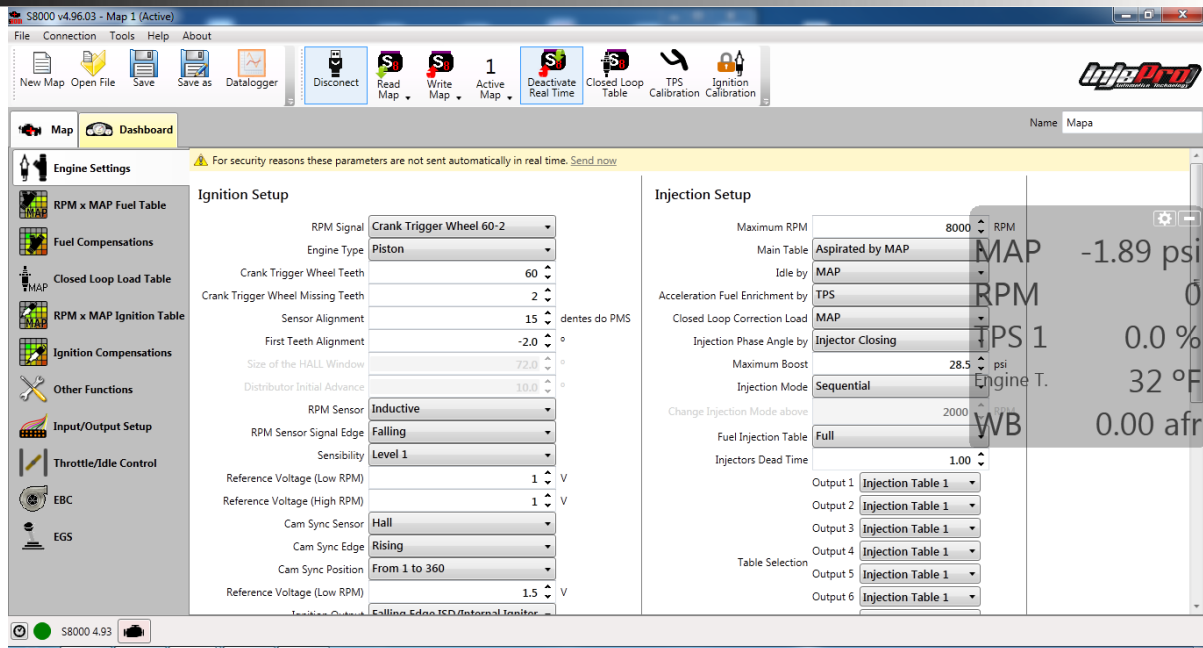
*Picture 45 - Settings Screen with the probe window*

A caution that must be taken when it is tuning the fuel injection tables with the real time, is disable the closed loop compensation in the module, because this compensation can confuse the work. Because of this, the software shows a warning when the real time is enabled and this compensation is activated (Picture 46).
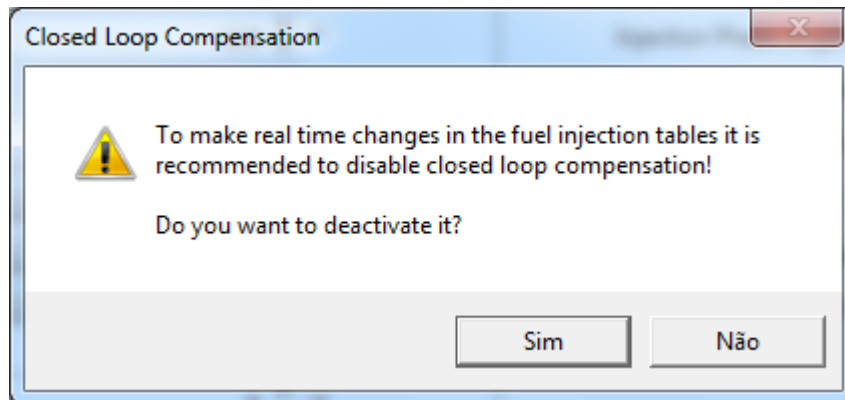
Picture 46 - Warning about the closed loop compensation activation in real time

Other characteristic of real time is about the modifications in the parameters of injection and ignition settings. These parameters in special are not sent in the exactly moment in which are modified. That is because, the modifications interfere in the inputs and outputs operation, where an exactly configuration can result in the damage of an input or output.

That is why, in the upper part of the injection and ignition settings screen, as can be seen in the Picture 45, there is a message warning about this fact. In the end of this message, there is a button "Send Now" which sends the changes to the module. Changing the tab, if there are modifications that have not been sent, the software asks if it is wanted to send or to discard the modifications (Picture 47).
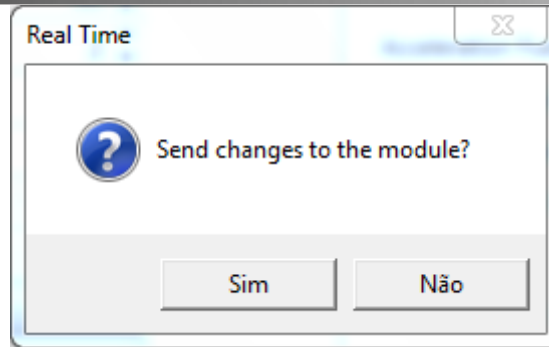
27 AUTOMAP

The Automap is an advanced function available by the software S8000 that uses the O_2 sensor information in order to compensate any of the fuel injection tables.

The Automap needs that the module is installed in the car and that the setup is in a stage in which the car could start and move on, because the Automap only does the fine tuning of the tables.

In order to access this function, set the real time, go to the menu Tools and click in Automap. If the button is disabled, check if the closed loop compensation is enabled, it must be disabled to active this function (see the section "Other Functions").

By entering in Automap, the software automatically changes to the tab of fuel injection tables and opens the Automap dialog showed in Picture 48.

In this dialog, you insert the O_2 sensor target value and the flow of the injectors being used. Start the car and click "Start" to initiate the Automap and start driving the car. Observe how the software will increase or decrease the value of the cells that are marked by the trace (red background). It is up to you to determinate when the Automap is already satisfactory. Click in "Finish" to finish the process.
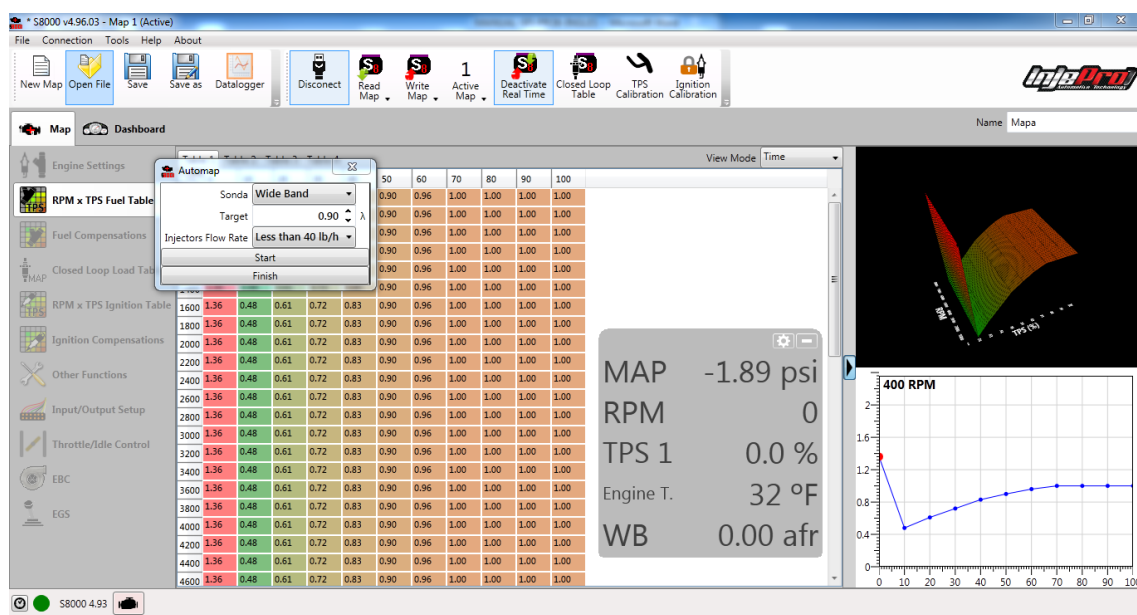
Picture 48 - Automap

28 CLOSED LOOP COMPENSATION TABLE

If the closed loop compensation is enabled, be it with narrow band or with wide band, the module uses the closed loop load table as targets values for O_2 sensor for each rotation versus load (TPS or MAP) situation, and apply the corrections on the fuel injections tables with the purpose of making the O_2 sensor value reach these target values.

The closed loop compensation table consists of a table with the percentages which were applied in each rotation line by load column.

The Picture 49 shows an example of closed loop compensation table.

Picture 49- Probe Correction Table

Getting this table from the module is possible to apply this compensation in any of the 4 fuel injection tables.

29 SOFTWARE SETTINGS
The software settings screen allows set the parameters related with the software operation.

In the Picture 50 this screen can be observed. It can be seen four tabs: Datalogger, Software, Folders and Bluetooth. Below, each one of this tabs will be described in details.

29.1 Datalogger
In datalogger tab can be configured, in the left part, the visibility, color, thickness, smoothness, group, and the channels order. Each item of the table in the left part represents a channel, and each column represents a view parameter of the same. Below there is a description of each parameter:

- Channel: Just identifies the channel that this item represents;
- Vis. (Visibility): This checkbox represents if the channel will be inserted in the legend and graphic. Clearing this box, the channel does not appear in the

legend and in the graphic. This is used to completely remove channels that are not being used;

- Color: Clicking in the colorful rectangle, it can be changed the default color of the channel. This color is used in the line drawn in the graph and in the highlight of the legend;
- Thickness: Clicking in the rectangle with a line drawn, it can be changed the default thickness of the channel. This is the thickness of the line drawn on the graph.
- Smooth: Sets the smooth level of the channel. It is possible to turn the smooth off, or activate with a level between 1 and 10. Bigger level implies in bigger smooth applied to the channel draw. This smooths the peaks of the channel. Use this parameter in channels that are unstable;
- Group: Determines in which group the channel will be inserted. This groups are drawn in different graphs (that are synchronized) and improve the visualization and analysis of the datalogger;
- At last, in order to change the order in which the channels appear in the legend, drag and drop its name in the desired position.
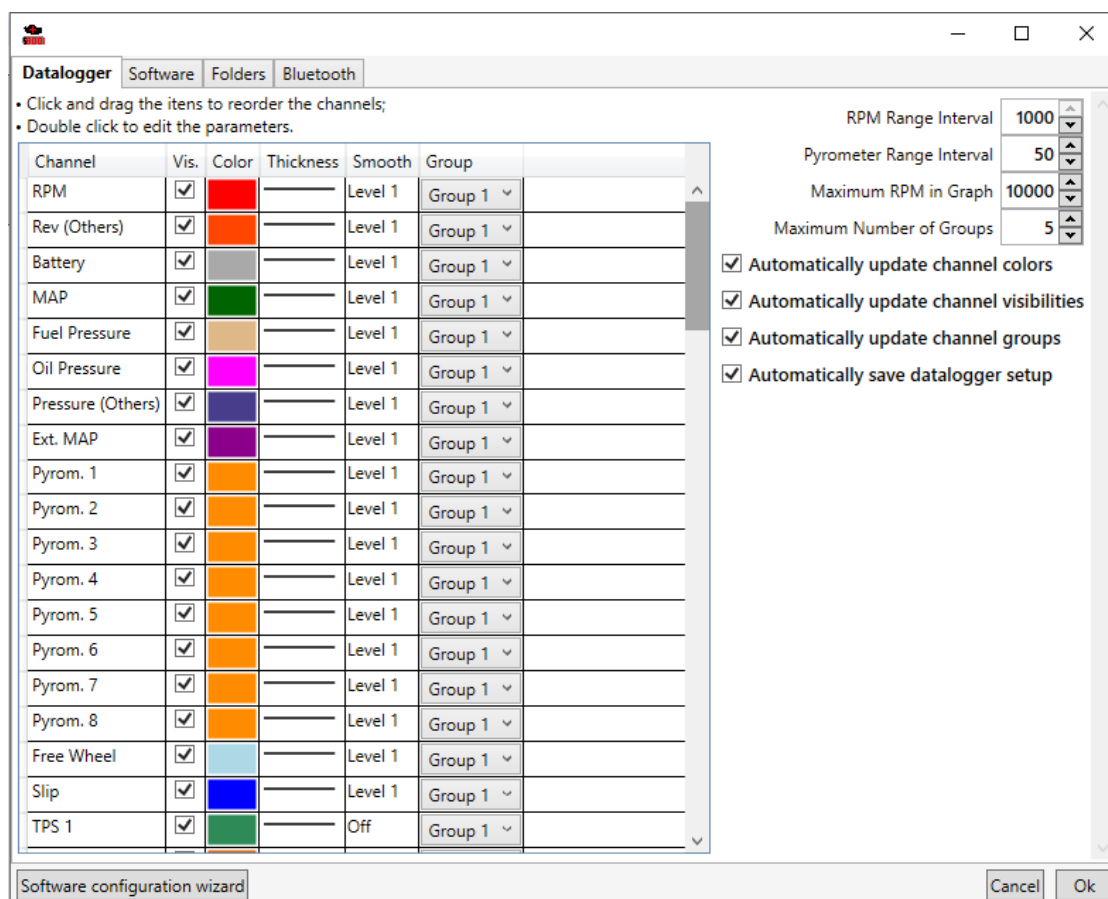
Picture 50- Software Settings Screen

Still in the Datalogger tab, in the right part, it is possible to see the additional settings. The Graphic Maximum Rotation, determines the maximum rotation visible in the graphic. The RPM Range Interval and the Pyrometers Range Interval, determines the size of the ranges to a calculation of rotation and temperature in which the engine remained the most, respectively (see the section Legend to have more information about these statistics). For example, with the configured values in Picture 50, the

rotation would be divided in ranges of 1000 RPM (from 0 to 1000, from 1000 to 2000, etc.) and would count how long the rotation remained in each of these ranges to be able to stablish in which rotation range the engine remained the most. It can be decreased this value in order to obtain shorter ranges and more defined values. However, it is recommended to not leave very small values, because the result may end up not being very significant, due to the creation of many ranges.

The field "Maximum Number of Groups" determines how many groups can be created in the datalogger. This field influences in the number of options that appears in the parameters "Group" in the list at left. Besides that, in the dataloggers legend, at the bottom, always appear an empty group. Dragging and dropping a legend channel to it effectively creates it. This makes easy the creation and manipulation of groups directly in the datalogger screen. However, if the number of groups created are already equal to the value of this field, this empty groups won't appear in the legend.

The four checkboxes right below indicates if the settings done in a datalogger will be saved as a default to the next datalogger.

The first of them "Automatically update the channels colors" indicates by changing the color of a channel in datalogger this color will be saved as a default for the channel. When opening a new datalogger, the channel will be with the same color left in the last datalogger.

The second one "Automatically update the channels visibility" indicates that becoming a channel visible or invisible in a datalogger (see the section Legend) this visibility will be saved as a standard for that channel. When opening a new data logger, the channel will be visible or invisible according to the previous datalogger.

The third, "Automatically update channel groups" indicates that by changing the groups of a channel this group becomes the default group for this channel. When opening a new datalogger, this channel will be in this same group.

The fourth, "automatically save datalogger configurations" indicates if the software must save the datalogger configuration when is closing. This way, when the software is opening again, the channels colors and visibilities will be in the same way in which they were selected the last time that the software were opened.

29.2 Software
In the software tab, we have the setup of language, units and real time window.
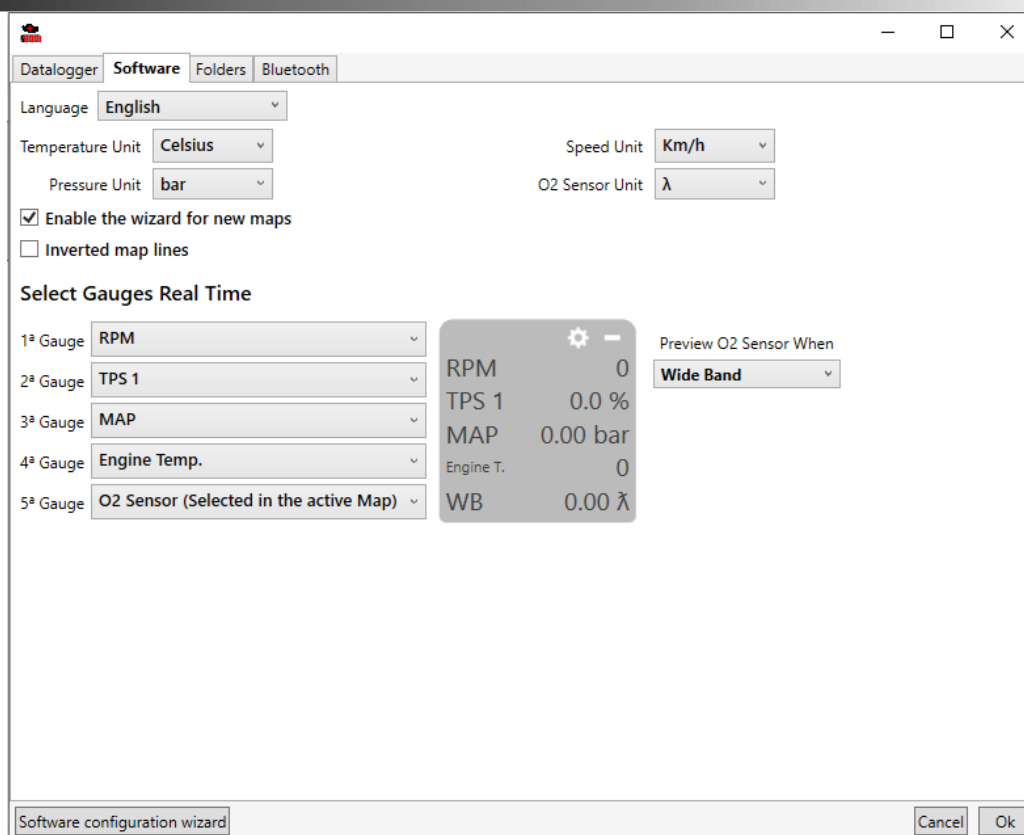
Currently, this software is available in three languages, Portuguese (Brazil), Spanish and English.

Below the language setup, we have the units' setup. In this part, we can setup the units of measure of the fields of the map and channels of the datalogger.

Changing the language or the units requires a restart in the software in order to apply the new settings.

The checkbox "Enable wizard for new maps" determines if, when creating a new map, will start or not the wizard for new maps. Uncheck this only if you are an experienced user, because the wizard helps to create a base map for the first start of the engine.

The checkbox "Inverted map lines" determines if the RPM lines of the full maps will be in descent order, allowing the user to use the software in the way it is most used to.

Below the checkboxes we have the configuration of the real time window. This window opens when the real time is activated. It has a few numeric gauges to show the sensors and actuators values during the map setup. Here we can configure the information each gauge will show.

29.3 Folders

In this tab is possible to set the default folders to open and save maps, and to open and save dataloggers (see the sections "Open Map", "Save" and "Save as" of the tool bar from the home screen and the sections "Open Data Logger", "Save" and "Save as" of the tool bar from the data logger screen for more information). The software will open these folders in order to reach maps and dataloggers, respectively, to open and to save.
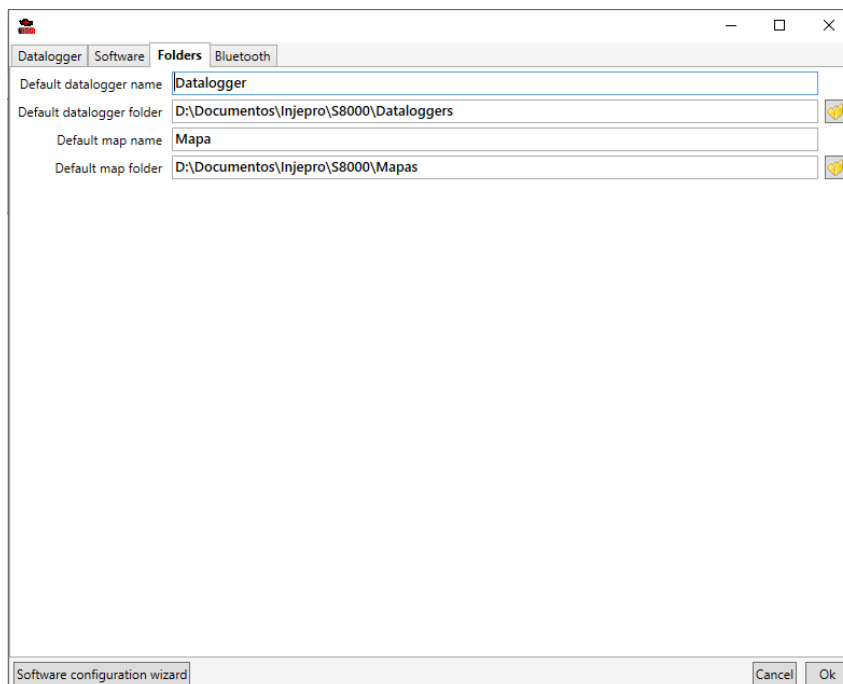
There is also the parameters "Default name for dataloggers" and "Default name for maps". The first is the name that the software will use in order to generate the name of each item when receiving the dataloggers list from the module memory. It will be concatenated at the end of the chosen name a number indicating the datalogger position in the memory. The second is the name that will be used to the field "Name" from a created map with the function "New" (see the section "New Map").

29.4 Bluetooth

The bluetooth tab allows the software to connect to a S8000 module through bluetooth, with the help of a CONNECT-PRO. If your PC/notebook has bluetooth, with use of a CONNECT-PRO you can connect to your S8000 module in a wireless way. Anything you can do in the software through USB, you can do with the bluetooth connection.

This function facilitates for those that are using a CONNECT-PRO to connect the S8000 module to use the mobile INJEPRO apps. With this function, it is not necessary to disconnect the CONNECT-PRO from the module to connect the USB of the PC. Just pair the CONNECT-PRO with the PC and use any of the features available.

For the first connection with a CONNECT-PRO device follow the steps below:

1- On the "Bluetooth" tab click on the checkbox "Enable Bluetooth Connection". After this the software will start searching for devices nearby;

a. If your PC does not have bluetooth, or if the device is not recognized, when clicking this checkbox the software will show a message error. In this case, check if the bluetooth is enabled (on notebooks it is necessary to turn on the bluetooth through buttons or keyboard combination, depending on the model);

b. If after the search the CONNECT-PRO is not on the list, check if it is connect to a S8000, and if the S8000 is powered, and redo the search through the button "Discover Devices";

2- Select on the list the item corresponding to your CONNECT-PRO and click in "PAIR";

3- The software will request the PIN of the device. The default is "1234";

4- After pairing, the device will show on the list under the "Paired" group. Select it again and click in the "Connect" button;

5- If the connection fails, make sure the CONNECT-PRO is indeed connected to a S8000;

6- If the connection is successful, the main window, that is in the background, will notify this, and the item on the list will appear with the background in the green color;

7- After this, just close the configuration window and use the software normally.

8- After the first connection, the software will always try to connect to bluetooth automatically, not requiring all these steps again. This will be necessary only if connecting to other CONNECT-PRO.

9- The software always try the automatic bluetooth connection with the last CONNECT-PRO that was connected. This device will show in the list with yellow background.

10- Ps. If your PC do not have a bluetooth from factory, buy a good adapter dongle, because many of them may not work, especially if using Windows 10.

29.5 Software Configuration Wizard

In the lower left corner of the settings window, it is possible to see a button called "Software Configuration Wizard". This is an assistant which guides the software setting process step by step (this assistant is also showed the first time that runs the software after installation). The Picture 51 shows the screens and the sequence of this assistant.
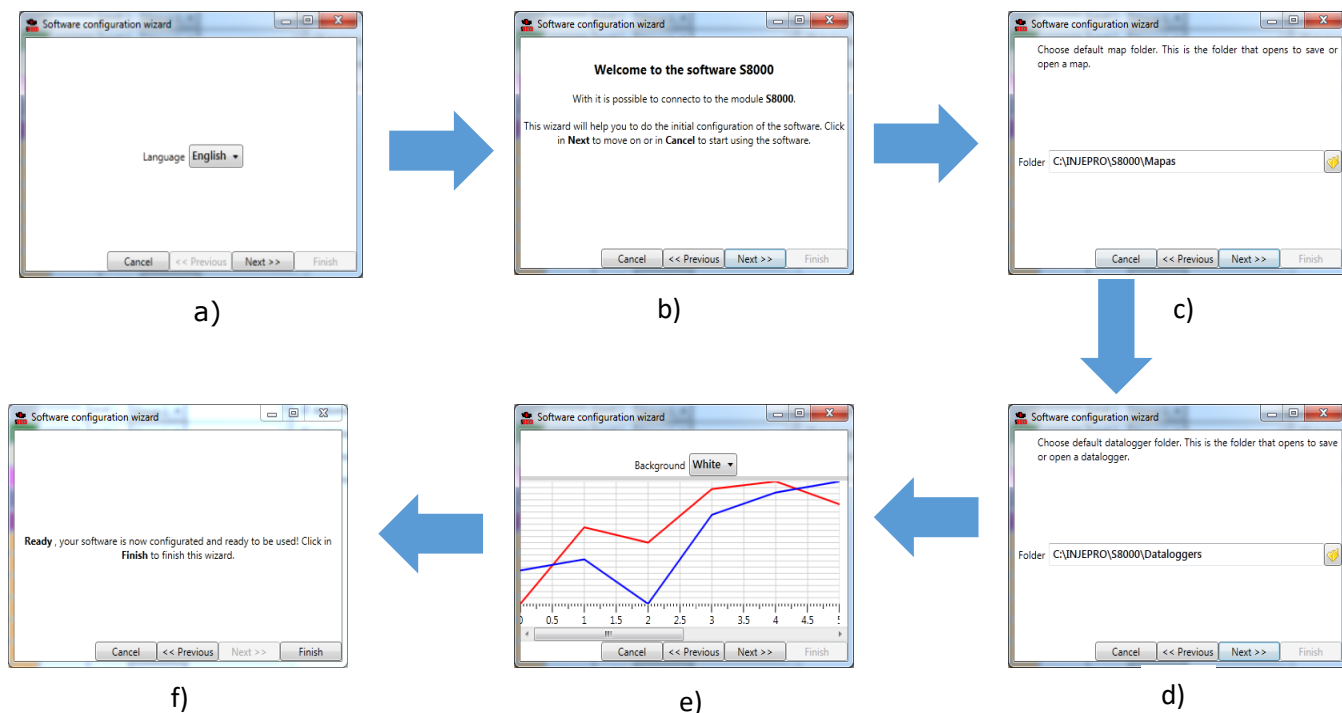

Picture 51- Assistant Screens of Software Settings

30 OPERATION IN TABLES

The tables (Fuel Injection, Ignition Timing and Compensations) have some operations that facilitate the job. These operations can be accessed in three ways: through Tools Menu (picture 7) in the Home screen, by clicking with the right button in the tables (picture 52) and through the shortcut keys.

Below the explanation about each one of these operations.
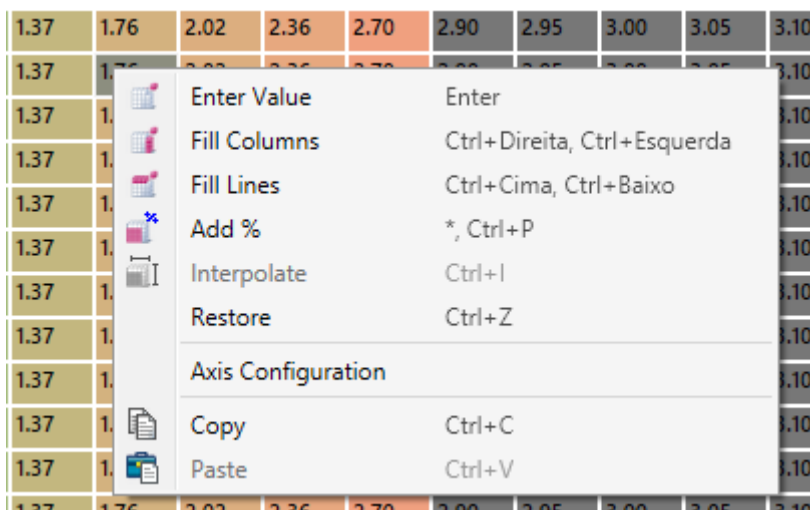
Picture 52 context menu (right button)

30.1 Enter Value
Shortcut: "Enter"

Selecting one or more cells it is possible to enter values to these cells. It can be pressed the key "Enter" in order to appear the dialogue showed in picture 53. In this dialogue, it is possible to insert value and press "Enter" again to confirm the value.

The value can also be directly entered without pressing the "enter" key, the dialogue already appears with the entered value.
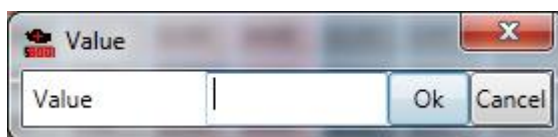
Picture 53 Entering with value in cells

30.2 Fill Columns
Shortcut: "Ctrl + Right" or "Ctrl + Left".

This operation allows copying a value for all the columns of a line. For this, select a cell with the wanted value and access the function (shortcut, right button or Tools Menu).

The picture 54 shows this operation.

Picture 54 – Fill maps columns

30.3 Fill Lines
Shortcut: "Ctrl + Up" or "Ctrl + Down".

This operation allows copying a value for all lines of a column. For this, select the cell with the wanted value and access the function (shortcut, right button or "Tool Menu"). The Picture 55 shows this operation.

Picture 55- Fill Lines of a Map

30.4 Add %
Shortcut: "*".

With this function it is possible add a percentage to the value of each cell. For example, by adding 10% to a cell with value 3.10, the software will calculate 10% of 3.10 (0.31) and it will add to the original value, getting value 3.41 at the end. The Picture 56 shows this operation.

In order to perform this operation, select the wanted cells and access the function (shortcut, right button or tools menu). Therefore, it will show the dialogue for the value insertion of the wanted percentage. Insert the value and click "Enter" to finish.

In order to subtract a percentage, insert a negative value to the dialogue. For example, -10% will subtract 10% of the cells values.

Picture 56 – Adding a percentage to the map

30.5 Interpolation
Shortcut: "Ctrl + I".

It is possible to interpolate the cell values. For this, select the wanted region to interpolate, and access the interpolation function (shortcut, right button or "tools menu"). The interpolation dialogue will be showed (Picture 57) to insert the wanted

values for the borders cells. By clicking "Enter" the borders cells will have the chosen values and the intermediate cells will have the interpolated values.


Picture 57 – Maps interpolation

30.6 Restore

This function serves to restart the originals values of a table. For example, opening a map and handling the tables, this function can be used to return the cells values to the values that they had when the tables was saved for the last time.

30.7 Axis Configuration

The S8000 has 4 tables which serve as a scale for the various maps it has. These scales are: RPM Scale (with 50 points), TPS Scale (with 11 points), MAP Scale (26 points) and Temperature Scale (11 points).

Setting these scales, it will be configured all the tables which are controlled by the same. For example, by setting the RPM scale, the full fuel injection tables, the fuel compensations by RPM, the ignition table, the ignition compensations by RPM and the other maps that have as lines or columns RPM values, the scales will assume these new values.
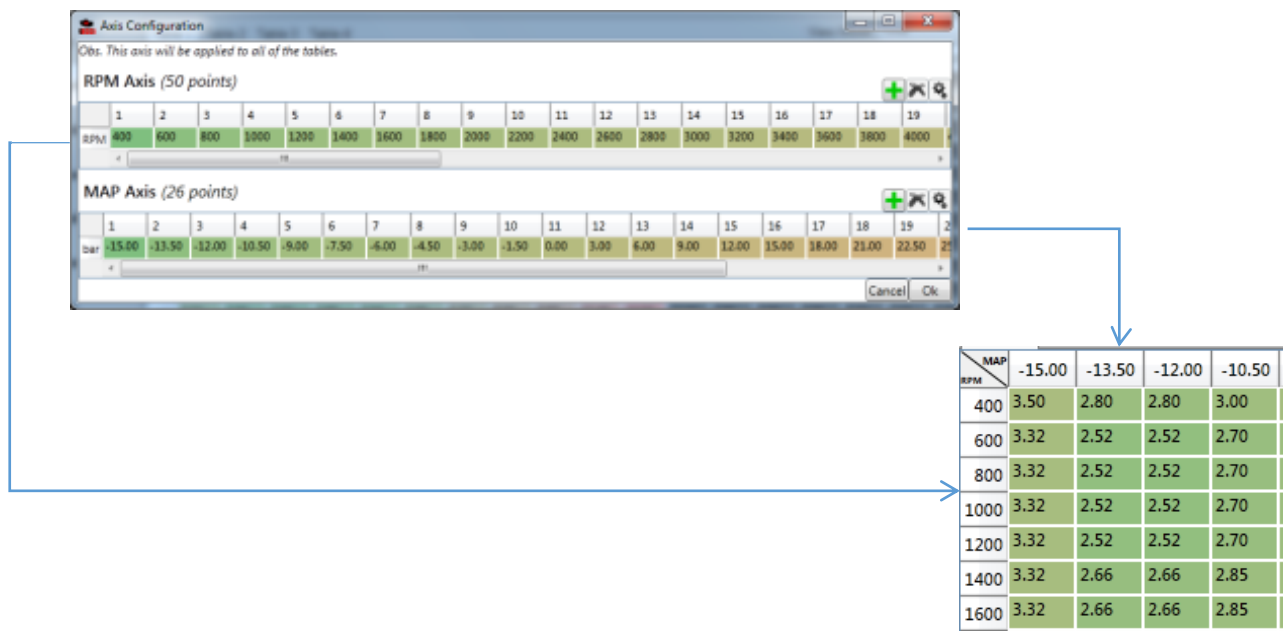
Picture 58 - Scales Settings

To set a scale, click with the right button in the table, through the "tools" menu, and go to "Set Scales". Doing this the window "Scale Settings" will be opened. In it will be the two scales that control the table, the lines scale and the column scale. In the Picture 58 it is possible to see what shows when configuring the fuel injection by MAP table. Then, it is possible to change the values as wanted.

However, it is necessary to notice some rules about the scales values. The scale must be always increscent, in other words, the value of a rear cell, must not have a shorter value than the previous cell. For example, in the rotation scale, if the third point has a value of 1200, the fourth point must not have a value of 1100, because it would be a smaller value than the third point.

Another rule is about the first point of RPM and MAP scales. These are not configurable because of the internal module operation.

In tables that have RPM or MAP lines or columns, the scales affect the amount of these lines or columns. For example, a full fuel injection table has the last line with the same rotation configured in the field "Main Table" of "Injection Settings". If the maximum rotation is as 7000, the complete map will show all the lines that have value lower or equal to 7000 RPM. Therefore, if the RPM scale has 40 points less than or equal to 7000, the full table will have 40 lines, if the scale has 30 points lower or equal to 7000, the full table will have 30 lines.

The same occurs with maps that have MAP columns, where the columns that appear are those that have lower or equal value as the field "Turbo Maximum Pressure" of "Injection Settings".

30.8 Copy
Shortcut: "Ctrl + C".

The tables allow copying the selected cell values in order to be placed somewhere else (other table, or in any other place that accept text, as Excel, for instance).

For this, select the wanted values and press the shortcuts keys, or click with the right button and go to "Copy".

30.9 Paste
Shortcut: "Ctrl + V".

The tables allow paste the values from other sources. For example, it is possible to copy a table values, and to paste the values in another table. It is also possible to copy the values from Excel spreadsheet and to paste in the table. By the rule, it is only allowed numerical values.


31 E-MAIL

This is an assistant to send e-mail to the INJEPRO assistants. It helps to attach maps and dataloggers and it already has the INJEPRO assistants e-mail addresses.

In order to this assistant work, it is necessary having a responsible program to send e-mail installed in the computer, as Outlook, for instance. This assistant will generate an e-mail that is sent by the responsible software.

The Picture 59 shows the assistant. At the top there is a field where it is selected which INJEPRO assistant to contact. Below there are two lists of attachments, one for maps, and the other for dataloggers. With the buttons "+" and "-" beneath the

lists, it is possible to add and remove maps and dataloggers from the attachments. The button "+" will directly lead to the default map or datalogger folder, depending on what is wanted to add.

By choosing the attachments click at "Create E-mail" and program will creates an email and will opens the responsible software by sending this email. There it is possible to insert the message to the assistant and send the e-mail.
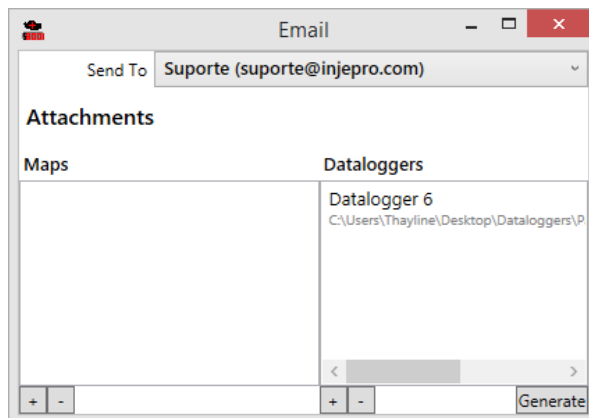

Picture 59- Email Creation

32 S8000 MODULE UPDATE

The software S8000 has a function to update the module firmware S8000.

In order to verify if there are updates to this module, connect it in the software. Go to the "Connection Menu" and click in "Update Module". Then it will open the dialog showed at the Picture 60.

This dialog has at the left part a list with the available versions, choose the wanted version, generally it will be the last, and see in the right part a description of what was changed in this version. Click in "Update" to start updating. This update may take some minutes.
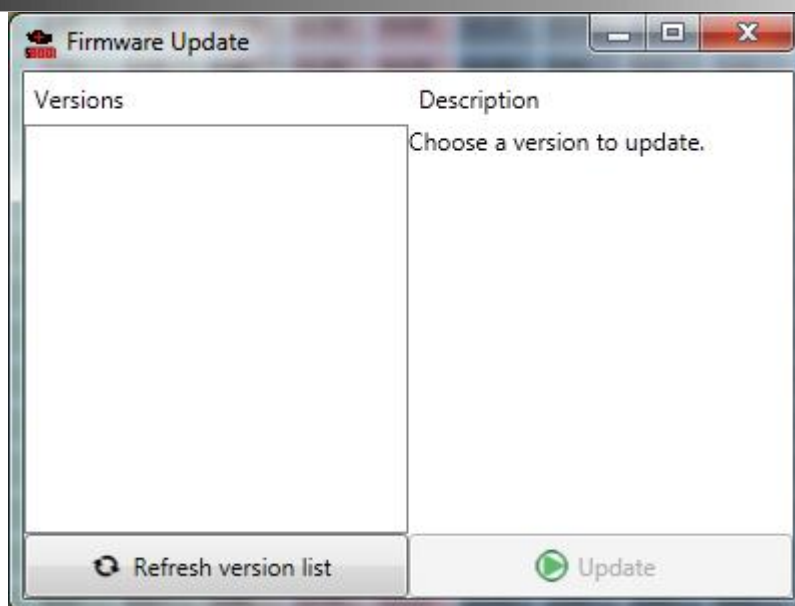
Picture 60- Firmware Update

33 S8000 PASSWORDS SETUP

The S8000 allows the activation of a password to protect its data. The software, when reading or writing a map, will request this password. Picture 61 below shows this request.
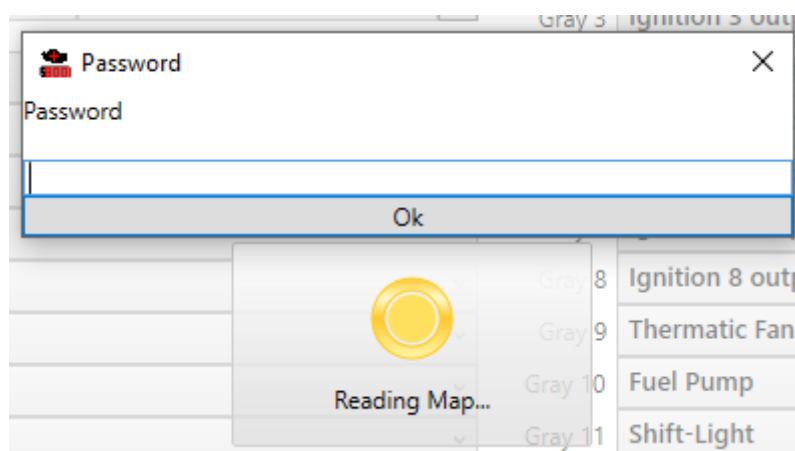
Picture 61- Password request when reading a map

The password can be requested through the button Password in the Connection Menu. It will open the screen shown in Picture 62 below. In it you can activate, deactivate, or change the password:

- If your module is without a password and wish to activate it, leave the field "Current Password" blank and fill the fields "New Password" and "Repeat New Password" with the desired password, and click in "Submit";
- If your module has a password and you wish to change it, fill the field "Current Password" with the current password, fill the fields "New Password" and "Repeat New Password" with the new password, and click in "Submit";
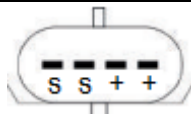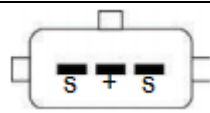- If your module has a password, and you wish to deactivate it, fill the field "Current Password" with the current password, and leave the fields "New Password" and "Repeat New Password" blank, and click in "Submit".
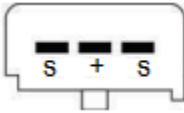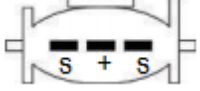
Picture 62- Password management screen
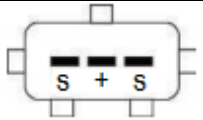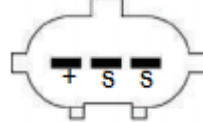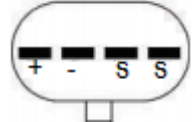
35 DOUBLE COIL CONNECTION TABLE

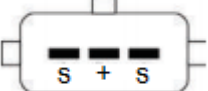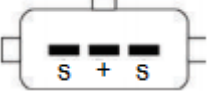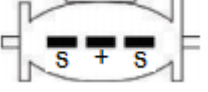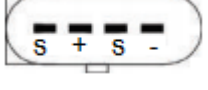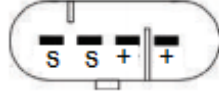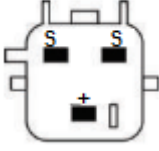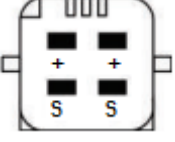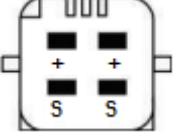| Coil	Application	Type	Pin Diagram
GM/Bosch F 000 ZSO 203 F 000 ZSO 205	Astra, Ipanema, Kadett, Vectra 8V	Without Internal Ignitter	Pin 1: ISD Output 1 Pin 2: Switched 12V (Relay) Pin 3: ISD Output 2
GM/FIAT/Bosch F 000 ZSO 213 F 000 ZSO 222	Celta, Corsa, Gol AP Flex, Deriva, Montana, Vectra 16V	Without Internal Ignitter	Pin 1: ISD Output 2 Pin 2: Switched 12V (Relay) Pin 3: ISD Output 1
GM/Delphi (arredondada)	Corsa MPFI de 1998 a 2002	Integrated Internal Ignitter	Pin A: Gray Wire nº2 Pin B: Gray Wire nº1 Pin C: Chassis (Ground) Pin D: Switched 12V (Relay)
GM/Delphi (quadrada)	Corsa MPFI até 1997	Integrated Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: Chassis (Ground) Pin 3: Gray Wire nº1 Pin 4: Gray Wire nº2
Bosch 6 Cilindros (0221503008)	**Omega 4.1 V6;** **Omega suprema 4.1 V6;** **Silverado 4.1 V6;** **Grand Blazer 4.1 V6**	Without Internal Ignitter	Pin 1: ISD Output 1 Pin 2: ISD Output 2 Pin 3: ISD Output 3 Pin 4: Switched 12V (Relay)
Bosch: 221503011 GM: 90506102 Opel: 1208076 Lucas: DMB824	GM: Vectra 1999>2002, Vectra 2.0 16V 1996>, Vectra 2.0 16V SFI 96>	Without Internal Ignitter	
Bosch: F000 ZS0 206, F000 ZS0 207; Fiat: 46752948; Cód. Original: 55189636; Magneti Marelli:	FIAT: Doblò 1.3 Mpi 16V 01-06, Palio/ Siena/ Weekend 1.0/ 1.3 Mpi 16V, Fire 1.0 8V 01-05	Without Internal Ignitter	

BI0014MM, BI0023M			
VW: 026 905 105; Bosch: F 000 ZS0 213	VW: Gol III 1.6Mi Flex 05.03~08.05 /1.8Mi Flex 02.05~08.05, Gol IV 1.6 Flex 08.05~06.08 /1.8 Flex 08.05~06.08, Parati III 1.6Mi Flex 05.03~8.05 /1.8Mi Flex 02.05~08.05, Parati IV 1.6 Flex 09.05 /1.8 Flex 09.05~12.08, Saveiro III 1.6Mi Flex 05.03~08.05 /1.8Mi Flex 02.05 ~ 08.05, Saveiro IV 1.6 Flex 09.05~08.09 /1.8 Flex 09.05~08.09	Without Internal Ignitter	
Bosch: F 01R 00A 036, F 01R 00A 025	CHERY: QQ 2012	Without Internal Ignitter	
Chery: A11-3705110EA; Bosch: 0221503465	CHERY: Tiggo, Riich V5, Eastar, A3, A5, SQR481 1.6L, SQR484 1.8L 2.0L engine; Chery A1, QQ6, SQR473 1.3L engine; Chery A5, E5, Fulwin2, Cowin, SQR477 1.5L engine; Chery Fulwin, Cowin, SQR480 1.6L engine; Buick Sail Epica; Chana CM5; HAFEI: Lobo, DA468, DA46.	Without Internal Ignitter	
Alfa Romeo: 60558152, 60809606; Bosch: 0 221 503 407; Ferrari: 134386, 7648797; Fiat/Lancia: Land Rover: ERR6045, ERR6566; VW: 48.905.105.1	ALFA ROMEO: 155 2.0 92-96, 164 2.0 92-98; FIAT: Tipo 1.6 IE, 1.6 Mpi 93-97, Uno 1.6 Mpi 94-95, Fiorino 1.6Mpi 95-96; VW: Gol/ Parati II/ III, 2.0 Mi 16V Gti 95-00; LAND ROVER: Discovery/ Range Rover 4.0 94-04	Without Internal Ignitter	
Bosch: 0 221 503 485, 0 221 503 487; Ford: 4M5G12029ZA,	FORD: Courier /Van 1.6i. EcoSport 1.6i, Fiesta 1.0i /Sedan /1.6i /Sedan, Focus 1.6i 8V /Sedan, Ka 1.0i /1.6i	Without Internal Ignitter	

4M5G12029ZB, FOCUS 1352562, 1459278, 1350562; Volvo: 30731416, 30731419, 31216444, 31216444-AA, 4S7G-12029-AB	(Todos Flex Zetec Rocam 01.08>), Mondeo 1.8L		
Mazda: L813-18-100	Ford: Fiesta Mk IV / V, Fiesta Van, Escort Mk VII, Courier 1.3, Ka 1.3i, Street Ka, Mondeo Mk II / III, Puma, Cougar, Focus, Escape, Fusion, Mazda: Demio	Without Internal Ignitter	
Bosch: F 000 ZS0 235; Fiat: 55226876, 55230507	FIAT: Uno 1.0 flex motor fire EVO 05.10>	Without Internal Ignitter	
Bosch: F 000 ZS0 243; Fiat: 55229930	FIAT: Doblo 1.8 MPI 16V/ Adventure Locker, Idea 1.6 16V /1.8 16V /Adventure, Palio 1.6 MPI 16V /1.8 MPI 16V Weekend Adventure, Punto 1.6 16V /1.8 16V, Siena 1.6 MPI 16V, Strada 1.8 MPI 16V (Todos Flex E.torQ 08.10>).	Without Internal Ignitter	
Bosch: F 000 ZS0 212; Cód. Original: 88SF-12029-A2A, 928F-12029-CA, 7U2Z-12029-A	FORD: Courrier 1.3, 1.4 97-99, Escort/ SW 1.8 /2.0 16V 98-02, Fiesta 1.0, 1.3, 1.4 96-99, Ka 1.0, 1.3 97-99, Ranger 2.3, 2.5i, 94-01	Without Internal Ignitter	
Bosch: F 000 ZS0 210, F 000 ZS0 209; Cód. Original: 032 905 106B /D; Magneti Marelli: BI0017MM; Delphi: CE20118	AUDI: A3 1.6 99-06; VW: Fox 1.0, 1.4, 1.6 Total Flex 03>, Polo/ Sedan, Total Flex 04>, Gol III, IV, V 1.0 Mi, 1.0 Turbo, 1.6, 05>, Kombi 1.4 Total Flex 06>, Golf IV 1.6 06-08, Parati 1.0 Mi 16V	Integrated Internal Ignitter	

Fiat: 7789346; Bosch: 0986221003	FIAT: Brava 1.6 16V (MPI) 08/99>06/03, Doblò 1.6 16V (MPI) 11/01>08/03, Marea, Marea Weekend 1.6 16V (MPI) 06/05>, Palio 1.6 16V (MPI) 04/96>02/03, Palio Weekend 1.6 16V (MPI) 05/97>02/03, Siena 1.6 16V (MPI) 10/97>02/03, Strada 1.6 16V (MPI) 02/98>02/03	Without Internal Ignitter	
Bosch: F 000 ZS0 221; Renault: 7700274008, 7700873701	RENAULT: Clio, Kangoo, Twingo 1.0, 1.6 8V (motor D7D 760) 00>, Logan 1.0, 1.6 8V (motor D&D 740) 02>	Without Internal Ignitter	
Bosch: F 000 ZS0 103; Champion: BAE800B; Cód. Original: 46548037; Magneti Marelli: 0780002010; Delphi: CE10103	FIAT: Siena 1.3, 1.5 98-05, UNO 1.5 Spi, Mile Mpi 93-03 Fiorino 94-04, Elba 93- 96, Premio 92- 93, Palio 1.0, 1.5 8V 98-02, Strada 1.0/1.5 8V,T	Without Internal Ignitter	
Bosch: 0 986 221 004; Hyundai: 27301-22040, 27301-22050; Standard: UF176; Wells: C1113; USA Group: C1113, UF178; Beru: 0040100264	HYUNDAI: Accent L4-1.5L 1995>1999, Accent 1.3 1994>2000, Excel 1.3	Without Internal Ignitter	
Delphi: DF20013; GM: 01104038, 10450424, 10490192; Magneti Marelli: BI0013MM; Cód. Original: 96350585; Bosch: F 005 X11 781; Delphi: DS20013	GM: Corsa 1.0 /1.4 /1.6	Integrated Internal Ignitter	

Fiat: FTP 55228006; Delphi: CE20132	Fiat: Uno Vivace 1.4	Without Internal Ignitter	
Delphi: CE20130; GM: 94716808	GM: Celta, Corsa, Meriva, Montana, Prisma 8V flex	Without Internal Ignitter	
Delphi: CE20131; GM: 24580298QTY, 94702536	GM: Agile 1.4, Cobalt /S10 8V Flex 2009>2012	Integrated Internal Ignitter	
Daewoo/GM: 93 363 483, 96 253 555; Delphi: CE10001; Opel: 19005265; Bosch: F000ZS0222	GM: Celta 1.0/1.4 8V 00>, Corsa/ Sedan, 1.4, 1.8 MPFi 02>, Meriva 1.4, 1.8 02>, Montana 1.4/1.8, 03, Prisma 1.4 06>; FIAT: Stilo, Palio, Siena, Idea, Dobló, Strada, Punto 1.8 8V.	Without Internal Ignitter	
Effa: GDQ170; Delphi: 19005270	HAFEI: Minyi Minz, Chana, Changhe, Shuanghuan CEO, Tianma pickup, Geely Meiri CK Emgrand EC7 View Englan SC7, Hafei Minyi, Chevrolet Spark, Great Wall Haval, Lifan 520; Geely 4G15 engine, DA465, B12. ASIA MOTORS: Towner E	Without Internal Ignitter	
Delphi: BID 00001; Magneti Marelli: BI0012MM; GM: 1103905; Cód. Original: 01 103 905, 10 457 075; Bosch: F 000 ZS9 200";	GM: Blazer, Corsa, S10	Integrated Internal Ignitter	
GM: 10457109, 10472748, 10474481, D547, D550, D583; Standard: DR41	Chevrolet: Beretta, Cavalier; Pontiac: Grand Am, Grand Prix, Sunfire, Tempest; Buick: Skylark	Without Internal Ignitter	

Hyundai /KIA: 27301 - 23700, 27301-23710; USA Group: C1434, UF419; Wells: C1434; Standard: UF419; MD: 158956	HYUNDAI: Elantra 2003>2006, Tiburon 2003>2008, Tucson L4-2.0L 2005>2009, Tucson 2.0 16V 2001>2004; KIA: Spectra 2004>2009, Spectra5 2005>2009, Sportage L4-2.0L 2005>2007, Sportage 2.0 16V	Without Internal Ignitter	
988F-12029-AC; Magneti Marelli: BI005S	FORD: Fiesta, Courrier, Escort Zetec	Without Internal Ignitter	
Peugeot: 597072, 597074, 9628158580, 596319; Citroën: 597072, 597074, 9628158580, 96246755, 96281585; Sagem: 2526117A, 25261174; Valeo: 245109; Lucas: DMB812; Bosch: 0986221034; Bougicord: 154301; Psa: 597072, 5970A9, 9624675580, 9628158580	PEUGEOT: 106 /307 /206 1.4i, 1.6i 8V 98~00, 306 1.4 /1.4SL /1.6 /1.6SR 8V 97~00, 306 Break 1.4 /1.6 8V 97~00, 306 Cabrioler 1.6 8V, 406 1.6 8V 97~00, Partner 1.6 8V 00>; CITROËN: C2/C3 1.1,1.4 02~03, Saxo (S0,S1) 1.0X/XS/VTS/VTL/VTR 96~03, Xsara /Picasso 1.4i,1.6i 97~99	Without Internal Ignitter	
Citroën: 597090, 597097, 9654347080; Peugeot: 597090, 597097, 9654347080; Bougicord: 154303.	CITROËN: Berlingo 1.1i /1.4 bivalent /1.4i bivalent 01/05, C2 1.1 /1.4 01/05, C3 1.4i 02/02, C3 Pluriel 1.4 05/05; PEUGEOT: 207 1.4 02/06, 207 SW 1.4 06/07, 1007 1.4 04/05, Partner 1.1 /1.4 /1.4BiFuel /Combispace 1.1 /1.4 01/05;	Without Internal Ignitter	

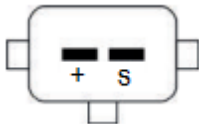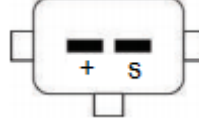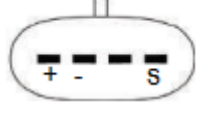|			
Renault: 8200084401; Peugeot: 598083; Cód. Original: 597083; Bosch: 0 986 221 036; Magneti Marelli: BI0025M	PEUGEOT: 206 1.0L 16V 00>; RENAULT: Clio, Kangoo, Twingo 1.0 16V (gasolina) 06/01>06/04, Kangoo Express 1.0 16V 10/01>06/04	Without Internal Ignitter	
Renault: 8200702693, H8200734204 - 77040001; Bougicord: 151408	Renault: Clio 1.0 16V (Hi-Flex) 01/09>, Kangoo 1.0 16V (Hi-Flex) 1/09>, Twingo 1.0 16V (Hi-Flex) 01/09>, Sandero, Logan; Peugeot: 1.0 16V Flex D4D 2013>.	Without Internal Ignitter	
Renault: 8200360911	RENAULT: Clio, Kangoo 1.0 16V (Hi-Flex) 07/04>12/08, Twingo 1.0 16V (Hi-Flex) 08/04>12/08	Without Internal Ignitter	
Valeo: 245098, 2526118, 2526118A; Peugeot - Citroën: 597098, 597075, 94632641, 96341314, 96632641, 9634131480; Fiat: 9663264180, 9634131380, 9634131490; Lucas: DMB866; Beru: 0040100348	CITROËN: C4 2.0 16V, C5 1.8 16V /2.0 16V, C8 2.0 16V, Evasion 2.0 16V, Xsara 2.0 16V, Xsara Picasso 1.8 16V 2005 /2.0 16V 2005; PEUGEOT: 307 2.0 16V 2005, 406 1.8 16V /2.0 16V, 407 1.8 16V /2.0 16V, 807 1.8 16V /2.0 16V	Without Internal Ignitter	
Valeo: 245095; Citroën: 597080	CITROËN: C3 1.6 16V, Xsara, Xsara Break, Xsara Picasso 1.6 16V 02>; PEUGEOT: 206, 307 1.6 16V	Without Internal Ignitter	
UF484; VW/Skoda: 06A 905 097, 06A 905 104,	VW AUDI: Bora 2.0l 98>05 , Golf IV 2.0I 98>06, New Beetle 2.0I 98>10, Touran 06>09, Santana 3000, Voyage /Saveiro /Gol 1.0	Integrated Internal Ignitter	
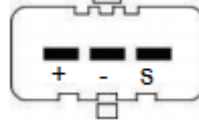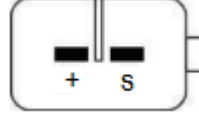
0040102029, 905100004	VHT G5 2010>; SKODA: Octavia 2.0I		

36 INDIVIDUAL COIL CONNECTION TABLE
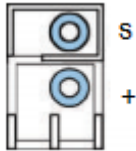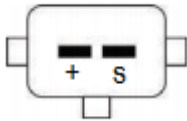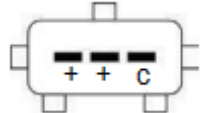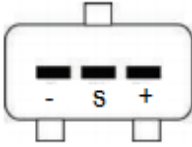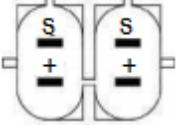
Coil	Application	Type	Diagram Pins
Bosch 0221504014 0221504460	Fiat Marea 2.0T, 2.4 (3,60ms) Fiat Stilo Abarth 2.4 20V	Without Internal Ignitter	Pin 1: ISD Output Pin 2: Chassis (Ground) Pin 3: Switched 12V (Relay)
Bosch 0221504024	Fiat Punto; Linea 1 .4 T-Jet	Without Internal Ignitter	Pin 1: Chassis (Ground) Pin 2: Switched 12V (Relay) Pin 3: ISD Output
VW /Audi 2 0V /BM W	VW /Audi 1.8 20V Turbo; BMW 328	Without Internal Ignitter	Pin 1: ISD Output Pin 2: Chassis (Ground) Pin 3: Switched 12V (Relay)
Magneti Marelli BAE700AK	Peugeot 306 e 405 2 .0 16V Citroen Xantia e Z X 2 .0 16V Maserati Coupé 3 .2 32V	Without Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: Chassis (Ground) Pin 3: ISD Output

Toyota 90919-02205 129700-5150	Toyota 2 JZ; Honda CBR 1000	Without Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: ISD Output
ACDelco 12611424	Corvette LS1	Integrated Internal Ignitter	Pin A: Chassis (Ground) Pin B: Battery Ground Pin C: Module's Ignition Output (Gray Wire) Pin D: Switched 12V (Relay)
Diamond FK0140 Diamond FK0186	Subaru WRX	Integrated Internal Ignitter	Pin 1: Saída de ignição SFI (Gray Wire) Pin 2: Chassis (Ground) Pin 3: Switched 12V (Relay)
Diamond FK0320	Pajero 3.8 6G 75 MiVec	Integrated Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: Module's Ignition Output (Gray Wire) Pin 3: Chassis (Ground)
Audi/VW Hitachi CM 11 -201	Audi A6, S3; VW Bora; Golf; Passat 1 .8 Turbo	Integrated Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: Battery Ground Pin 3: Module's Ignition Output (Gray Wire) Pin 4: Chassis (Ground)
Bosch 022 905 100x	VW V R6; Golf; Passat	Integrated Internal Ignitter	Pin 1: Battery Ground Pin 2: Chassis (Ground) Pin 3: Switched 12V (Relay) Pin 4: Module's Ignition Output (Gray Wire)
Denso 099700-101 Denso 099700-115 Denso 099700-061	Honda Fit; New Civic	Integrated Internal Ignitter	Pin 1: Switched 12V (Relay) Pin 2: Chassis (Ground)
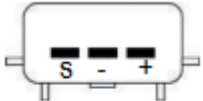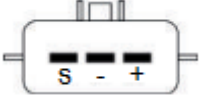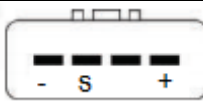
Hitachi C M 11 -109			Pin 3: ISD Output
VW 030.905.110 B	VW Gol/Voyage G6 (Pinagem referente ao conector original)	Integrated Internal Ignitter	Pin 1: Chassis (Ground) Pin 2: Module's Ignition Output (Gray Wire) Pin 3: Chassis (Ground) Pin 4: Switched 12V (Relay)
Kia 27301-3E400	Kia Soul 1.6 16v Cerato 1.6 16v	Without Internal Ignitter	Pin 1: ISD Output Pin 2: Switched 12V (Relay)
Denso 099700-115	Honda Civic	Integrated Internal Ignitter	S – +
Denso 27301-3C000	Sorento Azera	Without Internal Ignitter	+ S
F6T568 – 7124	Mitsubishi **YAMAHA R6 2008 ATÉ 2014**	Without Internal Ignitter	+ S
Hanshin	Nissan 370Z Infiniti fx50 G37 M37 3.7l 5.0L 5,6 L	Without Internal Ignitter	– S +
Bosch: 0 986 221 000; Cód. Original: 6NO.905.014; Magneti Marelli: BI0015M	VW: GOLF III 1.8, 2.0, Polo Classic 1.8, 2.0; AUDI: A80, 91-98, Seat Cordoba 1.0,1.8 95-02, Ibiza 1.0, 1.8 95-02, Toledo 1.8	Integrated Internal Ignitter	+ S –
VW: 867.905.104-A, 6N0905104; Bosch 0.221.601.005	GM: Ipanema 2.0 (MPFI) 04/96>11/97, Kadett 2.0 (MPFI) 12/96>12/98, Vectra CD 2.0 16V, Vectra GLS 2.0 (MPFI) 04/96>, Vectra GSI 2.0 16V 10/93>	Without Internal Ignitter	+ S

Bosch: 0221502007, 0221502008 VW/Audi/Suzuki: 330905115A Magneti MarelIi: 060717001012	VW: Santana 1994>2004	Without Internal Ignitter	
547.905.105B; Bosch: F000ZS0102	FORD: Escort 1.6, 1.8 2.0 XR3, 94-96, Pampa 1.896-97, Versailes/ Royale, 97-96, Verona 1.8i, 2.0i 94-96; VW: Gol II 1.0, 1.6, 1.8, 2.0, 94-97, Logus 1.6, 1.8, 2.0, 94-96, Parati II 1.6, 1.8, 2.0, 95-96, Pointer, 1.8, 2.0 94-96, Santana/ Quantum 2.0, 94-96	Without Internal Ignitter	
Bosch: 0 221 604 008; Magneti Marelli: BAE 680AR, BAE Q103; Valeo: 245175; Delphi: GN10334-12B1; Volvo: 9125601, 30713416.	Volvo: C70 I Cabriolet. C70 I Coupé S60/ S70 (P80_), S80 (TS, XY), V70 I Combi (P80_), V70 II Combi (P80_), XC70 CROSS COUNTRY, XC 90, CHEVROLET: CRUZE (J300) 1.6 09>	Integrated Internal Ignitter	
Bosch: 0 221 504 014; Fiat: 46.467.542	FIAT: Coupé 2.0 20V 04/98>09/00, Marea 2.0 20V 03/99>09/02, Marea, Marea Weekend 2.0 20V Turbo 12/98>03/07, Marea, Marea Weekend 2.4 20V 07/00>05/05	Without Internal Ignitter	
Renault: 7700875000; Bosch: 0986221001; Cód. Original: 82 00 765 822, 82 00 380 267, 82 00 568 671, 22448 00Q0B; Magneti Marelli: BI0021M	RENAULT: Clio/ Sedan, 1.6 16V HI Flex 04>, Scenic 1.6 1.6V Hi Flex 05>, Megane/ Grand Tour 1.6 16V 06>, Kangoo	Without Internal Ignitter	

	1.6 16V 07>, Logan 1.6 16V 07>		
Bosch: 0986221023; VW/Audi/Skoda/Seat: 036905715, 036905715A/C/E/F/G, 036905100A/B/C/D; Delphi: CE20030-12B1; Magneti Marelli: BAE408AE/245	VW: Golf IV Estate, Golf IV, Jetta IV, Jetta IV Estate, Polo, New Beetle Convertible, Touran, Rabbit V, Bora, Caddy, CC, EOS, Lupo, Passat, Scirocco, Sharan, Tiguan; Audi: A1, A2, A3, A4 1.4/1.6/2.0 com motor FSI e TFSI; Seat: Alhambra, Altea, Altea XL, Arosa, Cordoba, Ibiza Roomster Praktik, Superb, Yeti.	Integrated Internal Ignitter	
Nissan: 22448-ED800, 22448-ED800EP, 22448-C100A; Bosch: 0 221 604 014, 0 221 604 015, 0 221 604 020, 1 220 703 040; Renault: 7701065086; Standard: UF-591; Beru: 0040102506	Sentra 2.0 10.06>04.09, Tiida 1.8 Hatchback 03.07>; Livina 1.8 16V 2007	Integrated Internal Ignitter	
Renault: 8200699627; Bosch: 0221504030	RENAULT: Fluence 2.0 16V flex, zGrand Scenic 2.0 16V 09>, Latitude 2.0 16V 11>, Megane CC 2.0 CVT 10>, Megane Coupe 2.0 16V 08>, Megane Estate 2.0 16V 09>, Megane Hatchback 08>	Without Internal Ignitter	
Bosch: 0 221 503 018, 0 221 503 033; MB: 0 001 501 380, 000 150 12 80, 000 150 07 80	MERCEDES BENZ: Classe A 1.6 (A160), Classe A 1.9 (A190) 05/99>05/05	Without Internal Ignitter	

Bosch: F 000 ZS0 103; Champion: BAE800B; Cód. Original: 46548037; Magneti Marelli: 0780002010; Delphi: CE10103	FIAT: Siena 1.3, 1.5 98-05, UNO 1.5 Spi, Mile Mpi 93-03 Fiorino 94-04, Elba 93- 96, Premio 92-93, Palio 1.0, 1.5 8V 98-02, Strada 1.0/1.5 8V,T	Without Internal Ignitter	
Bosch: F 000 ZS0 116; Cód. Original: 30510-PT2-006	HONDA: Civic 1.6i 91-00, Prelude 2.2, 96-00, Accord 2.0, 2.2 93-02	Without Internal Ignitter	
Bosch: 9 220 081 504, F 000 ZS0 105; Magneti Marelli: BI0016MM; Cód. Original: 377 905 105 D; Delphi: CE10105	VW: Gol, Parati, Quantum, Santana, Saveiro	Without Internal Ignitter	
Bosch: 9 220 081 505; Magneti Marelli: BAE 504L, BAE Q020, BI0047MM; Renault: 7 700 749 450, 7 702 205 459, 7 702 218 697; Delphi: CE20053-12B1.	RENAULT: CLIO 1.6 8V 96~99. R19 1.6 8V 93~00, TRAFIC 1.6 8V 93~00, TWINGO 1.2i 93~97.	Without Internal Ignitter	
Bosch: F000 ZS0 104, 9 220 081 506; VW: 377 905 105B; Cód. Original: GW100 18 100; Delphi: CE10104	VW: Gol II 1.0 8V 98-05, Kombi 1.6 Mpi, 98-05	Integrated Internal Ignitter	
Bosch: 9 220 081 509; Cód. Original: 93 230 798; Delphi: CE10509; Magneti Marelli: BI0024M	GM: Ipanema, Kadett, Monza 1.8 /2.0 Efi 91-97.	Without Internal Ignitter	
Bosch: 9 220 081 510; Delphi: CE10510; GM: 93.230.799; Magneti Marelli: BI0011M	GM: Corsa 1.0/1.4 (EFI) 04/94>12/96	Without Internal Ignitter	
Bosch: 022506002, 0221506003, 0221506444, 0221506445; Mercedes Benz: 0001587003, 0001587103; Daewoo: 0001587003, 0001587503; Volkswagen: 00A905105;	Mercedes Benz: E-Class, SL, S-Class, C-Class, G-Class, SLK, Coupe, Saloon, C230, C280, C36 AMG, E320, S320, SL320, 300CE, 300E, 300TE; Volksvagen: LT28-	Without Internal Ignitter	

Skoda: 00A 905 105; Delphi: CE20038-12B1	46; Ssangyong: Korando 3.2; Daewoo: Korando 2.3/ 3.2		
Renault: 7700107269; Bosch: 0986 221033	RENAULT: Scenic 2.0 96-03/ Megane 2.0 97-03	Without Internal Ignitter	
Chery: S11-3705110JA; Motorola: 01R43059X01, 101R42076X01	Chery: QQ, Tiggo, Face.	Without Internal Ignitter	
Chrysler: 56028138, 56028138-AD/AF/AB; Standard: UF270, UF297; Wells: C1231	Chrysler: Aspen; Dodge: Dakota, Durango, Nitro, Ram 1500; Jeep: Commander, Grand Cherokee, Liberty; Mitsubishi: Raider.	Without Internal Ignitter	
Chrysler: 4751253, 5234210, 5234610, 5252577, 4797293, 90048-52091-000; GM: 19017110; Delco: C506; Lucas: DMB968; Standard: UF97	Chrysler: Daytona, Dynasty, Lebaron, Grand Cherokee V8; Plymouth: Acclaim, Sundance, Grand Voyage, Caminhões; Dodge: Caminhões; Jeep: Wrangler (6 Cilindros), Stratus	Without Internal Ignitter	
Daewoo: 33410A60B30-000, Y3C, 94582699	Daewoo: Tico	Without Internal Ignitter	
Delphi: 28063913, 19005277; JAC: PHC28063913, 1A14, 120421	JAC: J2, J3, J5 1.4/1.5	Integrated Internal Ignitter	
GM: 55584404, 96476983; Opel: 1208098; Delphi: 28326927; Airtex: 5C1703; Carquest: 522058; Standard: UF620; Wells: C1646	GM: Cruze 1.8 2011>, Sonic 1.6 16V 2013, Aveo L4-1.6L 2009>2011, Aveo5 L4-1.6L 2009>2011; OPEL: Astra GTC J 1.8 103Kw 140CV 796cc, Astra H	Integrated Internal Ignitter	

	Caravan 1.6 85Kw 116CV 1598cc, Astra J 1.6 85Kw 115CV 1598cc, Astra J Stufenheck 1.6 85Kw 116CV 1598cc, Astra Sports Tourer (J) 1.6 85Kw 116CV 1598cc /1.6 LPG 84Kw 114CV 1598cc, Insignia 1.6 85Kw 116CV 1598cc /1.8 103Kw 140CV 1796cc, Insignia Sports Tourer 1.6 85Kw 116CV 1598cc /1.8 103Kw 140CV 1796cc, Insignia tufenheck 1.6 85Kw 116CV 1598cc /1.8 103Kw 140CV 1796cc, Mokka 1.6 85Kw 116CV 1598cc, Zafira B (A05) 1.8 103Kw 140CV 1796cc, Zafira B Van 1.8 103Kw 140CV 1796cc, Zafira C (P12) 1.8 103Kw 140CV 1796cc /1.8 LPG 101Kw 137CV 1796cc; PONTIAC: G3 L4-1.6L 2009>2010, G3 Wave L4-1.6L 2009		
DENSO: 099700-101; HONDA: 30520-RNA-A01; STANDARD: UF582	Honda: Novo Civic 06	Integrated Internal Ignitter	
Denso: 099700-181, 099700181	Honda: Novo Civic	Integrated Internal Ignitter	
Denso: 90919-02239; Bosch: F 005 X11 783; Magneti Marelli: BAE Q126; Valeo: 245178; Delphi: GN10314	TOYOTA: COROLLA 1.6i 16V Sedan gas 02~09/ 1.8i 16V Sedan Flex 2008>/ 1.8i 16V Sedan gas	Integrated Internal Ignitter	

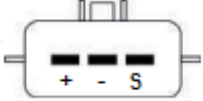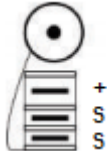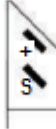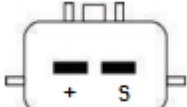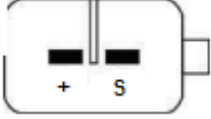|			
	02~08, Fielder 1.8i 16V Wagon gas 04~07.		
Toyota / Denso: 90919-02252, 90919-02258, 90919-C2003, 90919-C2005;	Pontiac: Vibe; Scion: XD; Toyota: Corolla, Matrix, Prius. Lexus: CT200H	Integrated Internal Ignitter	
Denso: 27301-2B000	HYUNDAI: i30 1.4 /1.6 2007>2011; KIA: Cerato 1.6 2004>, Soul 2009>	Without Internal Ignitter	
Mazda: L813-18-100	Ford: Fiesta Mk IV / V, Fiesta Van, Escort Mk VII, Courier 1.3, Ka 1.3i, Street Ka, Mondeo Mk II / III, Puma, Cougar, Focus, Escape, Fusion; Mazda: Demio	Without Internal Ignitter	
Ford: 988F12029-AC, 1S7Z12029-AD, 988F12029-AB, 988F12029-AD, 1067601, 1075786, 1130402, 1317972, 1319788, 1119835; Delphi: CE20119; Mazda: 1E04-18-10X, 1E05-18-100B, YF09-18-10X, 1F20-18-100, LF01-18-100; Lucas: DMB805; Magneti Marelli: BI0020MM	Ford: Fiesta, Ecosport, Courier, Escort, Focus, Ka, Mondeo, Kadett	Without Internal Ignitter	
Ford: CM5G-12029-FC	Ford: Ecosport, Fiesta, Focus, KA 1.6, Sigma	Without Internal Ignitter	
Ford: F7TU-12A336-AB, 3W7E-12A366-AA, F7TZ-12029-AB, IL2U-12029-AA, IL2Z-12029-AA, F7TZ-12A366-BA, F7TZ-12029-BA, F7TZ- 12029-CC, F7TZ-12029-CA, F7TZ-12A366-AB, 3W7Z-12029-AA	FORD E-150, E-250, F-150, E-350 /F-250 /F-350 /F-450/F-550 Super Duty, Crown Victoria, Mustang, Expediction, Excursion, E-150 /E-250 /E-350 Econoline (98-2000); LINCOLN: Town Car,	Without Internal Ignitter	

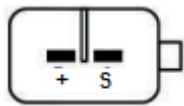|			
DG508, DG491, DG467, DG472	Navigator (98-2000); MERCURY: Grand Marquis (98-2000)		
Ford: 12A366-BA/B/C, 4W5G-12A366-BA, 4M5G-12A366-BB, 4M5G-12A366-BC, 4M5Z-12029B, 1224925, 1314271, LF16-18-100B; Wells: C1453	Ford: Focus 2.0 2003~2007, Ecosport 2.0 Duratec, Transit Connect, Escape; Mazda: Tribute Mercury: Mariner	Without Internal Ignitter	
E1EF12029AA, E2FZ12029A, E3FZ12029A, E73F12029AA, AB, E73Z12029A, E32Z12029A, 12321405, 12336833, 19017194, F-503, F-1953, 1694979-C1, F-515-18-10X, ZZMI-18-100, ZZM4-18-100, F3FU 12029AA, E2EF 12029AA, E3EF 12029AA, F32Z-12029-A, FD478X, DG434, DG-325A, DG-325AD, DGE-453	FORD: EXP 83~88, V6 3.0L 90~97, Taurus 86~95, Tempo 85~94; MAZDA: 626 94~97, MX-6 94~97, pickup 94; MERCURY: Capri 83~86, Colony Park 85~91	Without Internal Ignitter	
GM: 19 005 212; Fiat: 47.905.104	FIAT: Stilo 1.8 16V; GM: Astra 1.6 16V, Meriva 1.8 16V	Without Internal Ignitter	
GM: D539, D540, D555, 1103608, 1103646, 1103662, 1103663, 1103744, 1103745, 1103746, 10468391, 10472401, 10497771, 10495121; Isuzu: 8-10468-391-0	GM: Corvette 90~95, Impala 00~05, LLV (Postal vehicle) 94~95, S10 Pickup 94~03, Lumina 90~01, Lumina APV 92~96, Malibu/Malibu Maxx 97~03, Monte Carlo 95~05, Venture97~05, Oldsmobile Toronado 86~92	Without Internal Ignitter	
GM: D530, D532, D523, 8131936, J8131936, 1875894, 1985473, 10497132, CONP12029A,	CHRYSLER /GM: American Motors Concord 80~81, Corvette 74~81, El Camino 74~87, Impala 74~85,	Without Internal Ignitter	

DGG-419, 1694925-C1, IDO-4002S	Laguna 74~76, Astro 85, Fullsize Pickup 75~89, G Series Fullsizes Van /Express 75~88, P Series Van 75/89, Pontiac Parisienne 77~86, Pontiac Ventura 77		
GM: D525, D527, D528, D529 1187847, 8134003, J8134003, 1115444, 1115445, 1115447,1115449,1115460, 1115448, 1115455, DGG-222 DGG-322, DGG-421, 5-73, 5-74	GMC TRUCK: 75~77, 82~84; CHEVROLET TRUCK: 75~77, 82~84; OLDSMOBILE: 75~77, 81~84	Without Internal Ignitter	
GM: D-577, 10489421; Isuzu: 8-10489-421-0; Standard: DR49	GM: Blazer 4.3 V6, S10 4.3 V6; Buick: Roadmaster; Cadillac: Escalade, Fleetwood; Chevrolet: Astro Van, Camaro, Caprice, Express Van, Pickup Truck, Tahoe; GM: Pickup Truck, Jimmy, Safari Van, Savana Van, Sonoma Pickup Truck, Yukon; Isuzu: Hombre Pickup Truck; Oldsmobile: Bravada; Pontiac: Firebird	Without Internal Ignitter	
GM: 12578224, 12638824; Denso: 099700-0850; Wells: C1552; Standard: UF491	Chevrolet: Captiva; Buick; Pontiac	Integrated Internal Ignitter	
GM: 10458316, 1104082, 11004082; Opel: 1208021; Delphi: CE20009-12B1; Fiat/Alfa Romeo: 71739725, 71744369; Lucas: DMB939; Valeo: 245098	Chery; Peugeot; Citroën; Opel	Without Internal Ignitter	

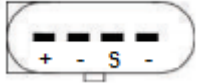|			
GM: D-535, D-537, D-544, D-560, D-573, D-575, DR37X, AF5FU12029AA, 1115315, 1115316, 1115317, 1115466, 1115467, 1115468, 1115491, 10477208, 8983501871, 83501871; ISUZU: 8-01115-315-0, 8-01115-466-0, 806673T, 817378T	GM /DAEWOO /FORD: Camaro, Caprice, Corvette, Storm, Impala, Fleetwood, Firebird, Cavalier 94~96, Skyhawk, Cimarron	Without Internal Ignitter	
NISSAN: 22448-4M500, 22448-4M50A; HITACHI: CM11-205; MAZDA: 1N10-18-100; BERU: 0040102021; LUCAS: DMB856; BOSCH: 0986JG1211	NISSAN: Sentra /Primera 99~08, Almera 1.5-1.8 00>08	Integrated Internal Ignitter	
Hitachi: CM11-108; Honda: 30521-PWA-003; Standard: UF374	HONDA: Fit 1.4 8V 2004>2008	Integrated Internal Ignitter	
Hitachi: CM11-109; Honda: 30520-PWA-003 /30520ERA201; Standard: UF373	HONDA: Fit 1.4 8V 2004>2008	Integrated Internal Ignitter	
Hitachi: CM11-110, 5215C; Honda: 30520-PWC-003; Standard: UF581; Magneti Marelli: BI0029M	HONDA: Fit 1.5 16V 2009>	Integrated Internal Ignitter	
CM1T-230A	NISSAN: Pathfinfer 3.3 V6, Veículos de 1996 à 2000 Motor 3.3 V6	Without Internal Ignitter	
Hitachi: 8971363250, 8970745540, 88921373, CM11-102.	ISUZU: D-MAX 3.5 turbo, Amigo, Rodeo, Trooper, Vehicross; ACURA: SLX HONDA: Passport	Integrated Internal Ignitter	
KIA: 27301-26640; HYUNDAI: 27301-26640, 03220-10874	HYUNDAI: Elantra 1.6W (2006~2007), Yuedong 1.6W (2006>), Accent	Without Internal Ignitter	
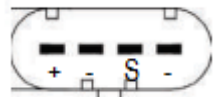
	1.6W (2006>); KIA: Rio 1.6 CVVT 05-06, 09		
Hyundai: 27301-0400	HYUNDAI: HB20 1.0 (Sedan/Hatch) 2012~2014; KIA: Morning 1.0 / 1.0 bi-fuel 2011~2014	Without Internal Ignitter	
Hyundai: 27301-3C000	HYUNDAI: Azera 2.4 11/2006>, Azera 3.3 V6 11/2006>, Santa Fé 3.3 V6 09/2006>, Sonata 2.0-2.4 12/2006>, Sonata 3.3 V6, Vera Cruz 3.8 V6 10/2006>. KIA: Carens 2.0 10/2006>, Carnival 2.7/3.5/3.8 V6 10/2006>, Mohave/Borrego 3.8 V6Todos, Opirus 3.8 V6 10/2006>, Optima/Magentis 2.0 4CC 09/2006>, Sorento 3.3/3.5/3.8 V6 09/2006>.	Without Internal Ignitter	
Hyundai: 27300-2E000	Hyundai: iX35, Sonata, Tucson; Kia: Cerato, Soul, Sportage	Without Internal Ignitter	
Hyundai: 27301-3E400; Standard: UF558	Hyundai: Santa Fé 2.7 (4x4) V6 2006>2007; Kia: Carnival, Optima 2007>2009, Rondo 2007>2009	Without Internal Ignitter	
Hyundai: 27300-3F100; Standard: UF611	Hyundai: IX35, Sonata, Sorento, Equus 2011, Genesis 2009>2010, Genesis Coupe 2010, Santa Fé 2010, Sonata 2008>2011, Tucson 2010>2011; Kia:	Without Internal Ignitter	

	Borrego 2009>2011, Forte 2010, Rondo 2009>2010		
Hyundai: 27301-37410	Hyundai: Santa Fé GLS Sport 2007> Kia: Optima EX,LX 2007>	Without Internal Ignitter	
Hyundai: 27301-23400, 0324622194, 0119621278; Champion: BAE 400D	Kia: Carens	Integrated Internal Ignitter	
Hyundai: 27301-2B100	Kia: Rio 1.6L 2012>, Soul 1.6L 2012>; Hyundai: Accent 1.6L 2012>, Veloster 1.6L 2012> Toyota: Altezza RS200	Without Internal Ignitter	
Hyundai: 27301-3E100; Standard: UF554	Kia: Optima 2.7L V6 2007>2008; Hyundai: Santa Fé 2.7L V6 2007	Integrated Internal Ignitter	
Hyundai: 27300-39050; Standard: UF-431, C01-27300-39800, PC98-27300-39050	Hyundai: XE300 / 350 2001>2003, XG300 3.0L 2001, XG350 3.5L 2002; Kia: Sedona 3.5L 2002>2005, Sorento 2003>2006.	Integrated Internal Ignitter	
Hyundai: 27301-2B010	HYUNDAI: I30 1.6 2007>; KIA: Cerato 1.6 2006>, Soul 1.6 2009>	Without Internal Ignitter	
KIA: 0K013-18-100, 88921371, E501C; CHRYSLER / MITSUBISHI: MD362907; HYUNDAI: 0K01318100	KIA: Sportage 95~02	Without Internal Ignitter	
Mitsubishi / Suzuki: 33400-65J0, H6T11371; Regitar: RUF562	SUZUKI: Grand Vitara 2006>2008 / SX4 2007>2009	Integrated Internal Ignitter	

Mitsubishi: MD362907, MD366821, MD362913, MD325048, MD361710, MD362903; Regitar: RUF141; Standard: UF295; Bosch: 0221503465; Denso: 099700-048; Hafei: MD362903; Lucas: DMB1010	Mitsubishi: Eclipse, Galant, Lancer, Mirage, Outlander; Chrysler: Sebring; Dodge: Stratus	Integrated Internal Ignitter	
Mitsubishi: H3T024; Mazda: 155852, F69651971; Regitar: RUF966; Diamond: F-696 618393; Standard: UF371	MITSUBISHI: Eclipse 1990>1995, Expo 1993>1994, Expo LRV 1992; MAZDA: 626 1990>1996; DODGE: Colt 1993>1994; EAGLE: Summit 1994>1994; PLYMOUTH: Colt 1992>1994	Without Internal Ignitter	
CM1T-230, CM1T-227; Nissan: 22433-F4302	NISSAN: 84~99	Without Internal Ignitter	
NISSAN: 22433-53F00, 22433-55Y00, 22433-65Y10, 22448-1C701, 22448-37J10, 22448-37J20, 22433-65Y1093	TOYOTA: Serena 1.6 16V 88~97; NISSAN: Patrol 88~97	Without Internal Ignitter	
RENAULT: 7701031135, 7701030273, 33002299, 12336238; MAGNETI MARELLI: BAE504B; VALEO: 245054, DMB823; SAGEM: 2526023, 2526048; BOSCH: F-000-ZS0-115; BERU: 0040100316, ZS316; LUCAS: DLB204, DMB823; VOLVO: 3287677, 3287677-3	RENAULT: R19 /R21 1.8 /2.0 /Laguna 2.0 84~92	Without Internal Ignitter	
Renault: 82007658 82. 7700875000, 78419001, 7700875000, 7700107177, 7700113357, 7700113357A,7700875000, 0040100052, 8200208611,	Renault: Clio, Kangoo, Livina, Logan, Sandero 1.6 16V, Avantime, Espace, Grand Scenic, Laguna,	Integrated Internal Ignitter	

8200154186, 8200154186A,8200380267, 029700-8291, 21595273-2,2526181A; Valeo: 21603121-9, 245104; Lucas: DMB804; Bosch: 0986221001; Nissan: 22448-00QAA,22448-00QAC,22448-00QAE; Opel: 91159996,4408389	Megane, Modus, Thalia, Trafic II, Vel Satis; Vauxhall: Vivaro; Dacia: Logan; Morgan: Plus Four; Nissan: Kubistar, Primastar; Opel: Vivaro.		
TOYOTA: 90919-02240, 90080-19021, 90919-T2003; LUCAS: DMB902; STANDARD: UF-316	TOYOTA: Corolla / Fielder 01~06, Prius 1.5 00>09, Yaris 99>11	Integrated Internal Ignitter	
TOYOTA: 90919-02215, EZX-147A, 88921336, 9008019012, E588; Standard: UF-155; Wells: C1040	TOYOTA: Camry 95, Solara, Avalon	Without Internal Ignitter	
TOYOTA: 90919-02163; GM: 94855502; LUCAS: DMB949; BOSCH: F000ZS0121; ROOTS: 0880016	TOYOTA: Camry 2.2 92~95, Rav 4 2.0 16V 96>, Corolla 95~97	Without Internal Ignitter	
Toyota: 90919-02135, 90919-02139, 90919-02196, 90919-02152; Vag: J9091902139; VW: J9091902139; Standard: UF40	CHEVROLET: Nova 85>88, Geo Prizm 90>92; TOYOTA: Camry 83>91, Celica 86>93, Celica Coupe 1989>1994, VAN 84>89, VAN Wagon 1988, Carina II 1987>1993, Carina II Saloon 1987>1993, Carina II Station Wagon 1987>1992, Corolla 1983>1989, Corolla 1987>1994, Corolla 1.6 i Saloon 89>93, Corolla Compact 1987>1995, Corolla Compact 1.6 i Hatchback 89> 92, Corolla Liftback 1983>1989, Corolla	Without Internal Ignitter	

	Liftback 1.6 Hatchback 85> 87, Corolla Liftback 1987>1995, Corolla Liftback 1.6 Hatchback 89>92, Corolla Station Wagon 1987>1992, Corolla Station Wagon 1.6 Estate 89> 92, Hilux II Pickup 1982>2005, Hilux II Pickup 1.8 Pickup 88>94, Hilux II Pickup 2.2 4WD Pickup 87>89, Liteace Box 1992>1995, Liteace Box 2.2 Box 92>95, Liteace Bus 1992>1998. Liteace Bus 2.2 Bus 92>95. Modell F Bus 1982>1990, Modell F Bus 2.0 Bus 88>90, Modell F Bus 2.2 Bus 87>90, Tercel 1982>1988, Tercel 1.5 4WD Hatchback 86>88; VOLKSWAGEN: Taro 1989>04 - 1997>03, Taro 1.8 Pickup 89>94, Taro 2.2 Pickup 89>94.		
Audi/VW: 06A.905.115, 06B.905.115H, 06B.905.115J	AUDI: A6 1.8 (Turbo); SEAT: Seat, Skoda 1.8 (Turbo); VW: Bora, Golf, Passat 1.8 (Turbo)	Integrated Internal Ignitter	
VW: 030 905 110 B	VW: Gol geração VI, Novo Fox, Voyage geração VI, Saveiro geração V	Integrated Internal Ignitter	

VW / Audi: 06F905115, 06F905115A/B/C/D/E/F, 07K905715, 07K905715A/B/C/D/E/F, 06H905115, 06H905115A/B/, 0221604115.	VW: Passat, Jetta 2.0 FSI, Jetta Variant 1.8/2.0 2005>2010, Tiguan 2.0 2007>, Touareg 4.2 V8 FSI 2006>, Golf V; Audi: A3, A4, A5, A6, R8, TT, Q5, Q7 TSFI; Seat: Toledo III	Integrated Internal Ignitter	

37 WARRANTY

The INJEPRO provides a warranty of 5 years from the date of acquisition described in the invoice to manufacture defects. The INJEPRO is not responsible by:

- **Defects caused by damage;**
- **Wrongly Installation;**
- **Improper Maintenance;**
- **Damage caused by incorrect settings;**

The violation of the seal implies in the total loss of the warranty, having no right to a free maintenance if needing arise.

For a total use of this product, it is necessary that the mechanical and electronics parts are in perfect condition. The installation and operation must be done by a qualified professional with knowledge in preparation and settings of engines with electric injection.

For more information contact:

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