



Software Installation and Calibration Manual

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1. Introdução

requisitos de configuração do computador

Sistema para computador portátil: Windows XP、Windows 7、Windows 8、Windows10

Capacidade do disco rígido: 10G

Resolução do monitor: maior que 1024 * 768

2. Instruções de instalação e desinstalação do software

2.1 Instalação de software

Abra o CD ou o pacote compactado como o mostrado abaixo:

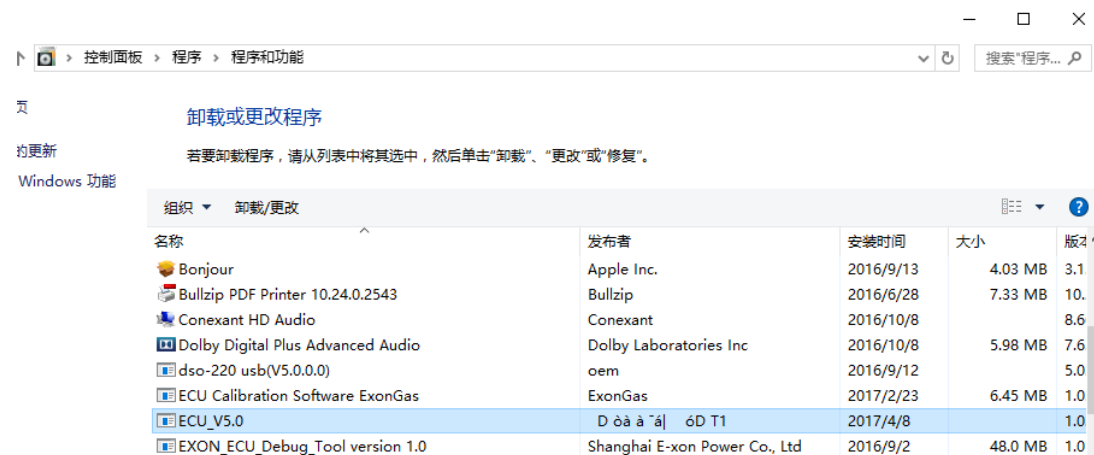


Clique duas vezes no "setup", o programa será instalado automaticamente.

2.2 Desinstalação do software

Passos de desinstalação:

Abra o painel de controle, escolha "Adicionar ou remover programas"



Escolha "ECU_V5.0" na lista de programas, clique no botão direito para escolher "Alterar/eliminar"

Depois de confirmação, o software será desinstalado com sucesso.

2.3 Instalação do driver USB.

Passos de instalação:

Clique duas vezes no driver (como mostrado na imagem 1), escolha "Remover" (como mostrado na imagem 2)

Imagem 1

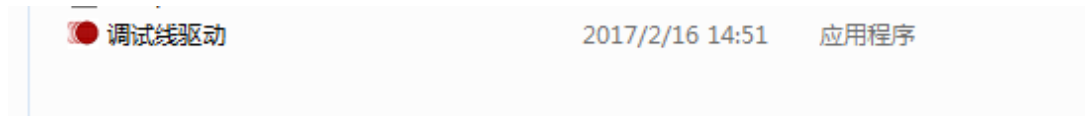
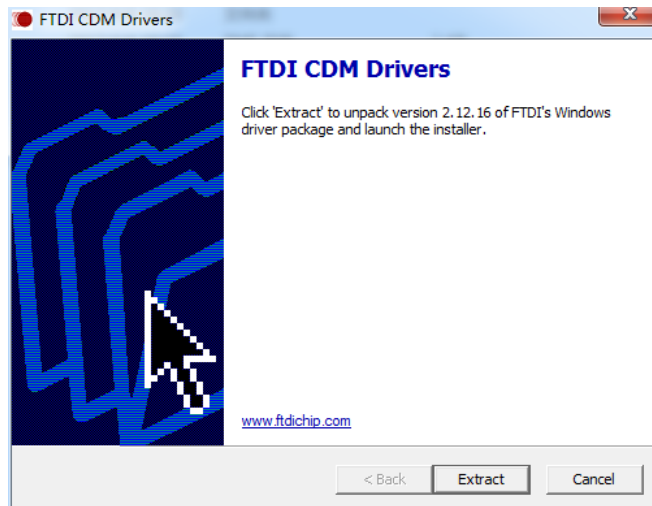
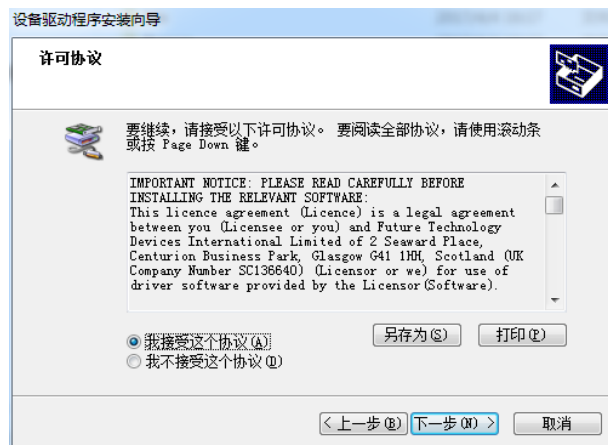


Imagem 2



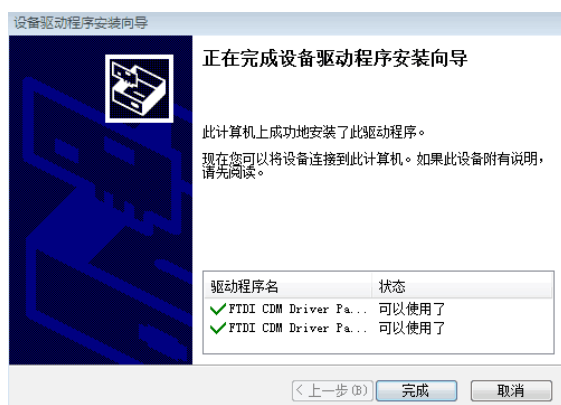
Escolha "Aceito este acordo" e clique em "Avançar" (como mostrado na imagem 3)

Imagem 3



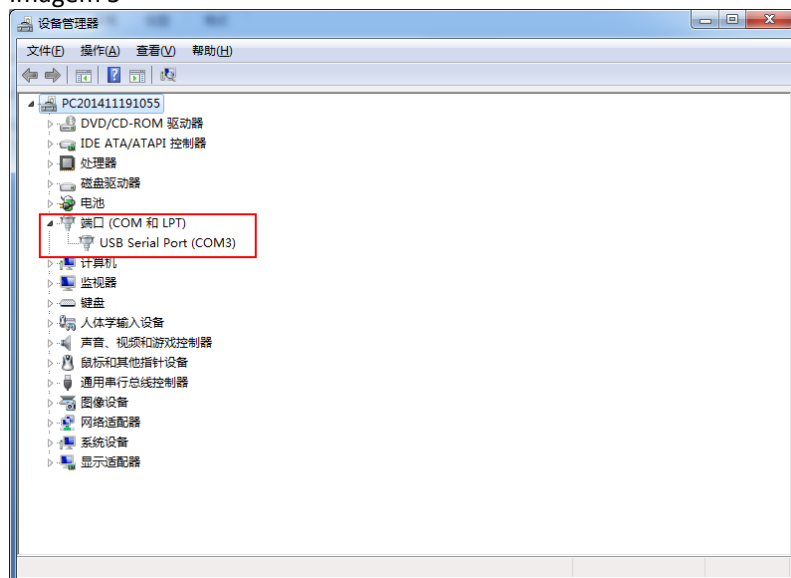
Depois de "Feito", o driver será instalado com sucesso (como mostrado na imagem 4) .

Imagem 4



Conecte o computador portátil com o cabo USB. Quando no Gerenciador de Dispositivos exibe o COM, significa que o cabo USB se comunica com o computador portátil com êxito (como mostrado na imagem 5).

Imagem 5



3. Instruções de funções básicas do software

3.1 Página Principal do Software



Instruction of the function block and functional description

Communication status	Display the connection status of the software and ECU, click it to restart the connection
ECU status display	Display the status of "Petrol or Gas" status from ECU, left click can change between the petrol mode and gas mode, double right click can be forced to gas mode
Version NO.	Display the ECU version No
Main function area	
Configuraion	ECU setting and calibration
Display	Display main data
Wave	Waveform display various data from the ECU
Auto-calibration	Do Automatically calibration on the parameters to match with the vehicle.
Diagnosis	Display the gas system running status
Save the data	Save the parameters of the current vehicle settings (It should be in the normal communication condition between ECU and software)
Load data	Load and save Settings parameters (It should be in the normal communication condition between ECU and software)
Exit	Exit the software

3.2 The Basic Setup Instructions



Function selection area: Choose the function button to enter the corresponding function module.

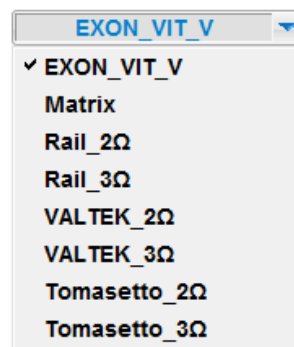
Data selection area: Set the parameter data in the function module.

Data displaying area: display Real-time data from engine.

3.2.1 The Basic Parameters

The function block mainly set the system sensor configuration

- a. Engine cylinders: 3 or 4 cylinder two options, choose according to the actual circumstance of the car.
- b. Engine type: Natural Aspirator or Turbo Charge two options, choose according to the actual circumstance of the car.
- c. Start and stop mode: when the car with a start-stop function are running the start-stop function, if the engine stops running more than 5 minutes, the engine start with oil and then to change to gas; if less than 5 minutes, the engine will start directly with gas.
- d. Fuel type: CNG or LPG two option, choose according to the real conditions.
- e. RPM signal: ignition signal or petrol signal two option, choose according to actual connection; the system defaults to ignition signal, to make RPM signal more accuracy.
- f. Ignition signal type, Choose 5V or 12V, according to the vehicle point signal voltage, ECU can't collect right RPM signal if Choose wrong.
- g. Ignition coil type: single ignition coil (independent ignition) or double ignition coil optional ignition (a group) two option , choose according to the actual vehicle; to adjust the parameter to make RPM in software same with car dashboard RPM.
- h. Temperature reducer signal:4.7K or 10K two option, the system defaults to 4.7K.
- i. Injector Type: injector type installed and injector type choose in software should be same, otherwise it will be damaged, the system defaults to E-XON_VIT_V.



- j. Switch type: LED switch or digital switch two options, choose according to the real conditions. If system use digital switch and high pressure sensor, please Choose digital. If system use LED switch and meter, Choose LED.
- k. Gas level sensor type



HPS01 is CNG high pressure sensor, power voltage 5V, output signal 0.5-4.5V.

G02-3 is CNG pressure gauge, power voltage 5V, output signal 5V-0V

AEB1050 is LPG sensor, resistance range 4.7 kilohm.

AEB1090 is LPG sensor, resistance range 0 to 90Ω.

3.2.2 change over



Change over is the necessary conditions from petrol to gas or gas to petrol.

1. Petrol to gas

a. Engine speed: The minimum RPM of the engine from petrol to gas, the system defaults 1500rpm / min. Fuel will be automatically changed to gas from petrol when RRM is more than 1500 rpm/min.

b. Reducer tempt: Engine's Minimum water temperature requirement from petrol to gas, the system defaults 40°C .

It means reducer temperature must reach to this setting value, then the engine can change to gas.

-- If setting temperature too low, engine can't run normally because reducer preheating not enough make the gas outlet is not enough.

-- If setting temperature too high, the engine change from petrol to gas time will be delayed.

c. Overlapping time: The Minimum waiting time from engine starting (petrol) to gas, the system defaults to 10s.

d. Minimum Gas pressure from Petrol to gas: Gas pressure requirement from petrol to gas. the system defaults 1.8bar for CNG and 1.4bar for LPG.

e. Change over type

RRM accelerate: It means when engine RPM exceeds engine speed setting, the fuel will change from petrol to gas.

RPM deceleration: It means when engine RPM exceeds the engine speed setting, then goes down to engine speed setting, the fuel will change from petrol to gas.

f. Change sequence

Sequential switching: changing from petrol to gas according to engine cylinder sequence

Simultaneous switching: each cylinder of engine change from petrol to gas at the same time, usually we can try this function when vehicle appears shaking from petrol to gas.

In the process of engine from petrol to gas, gas ECU first check whether the water temperature reaching to the setting value and then check minimum gas pressure reaching to the setting value. After they both reaching to the setting value, the red and yellow lights of the switch both flash and warn at meantime. Press the accelerator, engine RPM reach setting speed. After all the requirements are met, the engine will change the petrol to gas.

2. Operation at minimum/maximum

a. Petrol Use of Engine Speed

Switch to petrol automatically when RPM exceed the setting RPM

b. Petrol Use of Injection Time

Switch to petrol automatically when petrol injection time exceed the setting petrol injection time

c. RPM for identifying

Set the minimum petrol RPM

d. RPM minimum Operation

Petrol engine is in petrol model when RPM under the setting RPM, switch to gas when RPM exceed the setting RPM

Return to petrol switch to petrol when RPM under the setting RPM, switch to gas automatically after 20 cycles in petrol

3 . Gas to Petrol

Minimum gas pres(bar): When the gas pressure is lower than setting value, the engine will change from gas to petrol, the system defaults 1.2 bar for CNG, 0.8 bar for LPG.

3.2.3 Map calibration table

Map calibration table: calibrating the gas injection time.

全段比例

MAP表

Tinj/RPM	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500
2.0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	0	0	0	0	0	0	0	0	0	0	0	0
3.0	0	0	0	0	0	0	0	0	0	0	0	0
3.5	0	0	0	0	0	0	0	0	0	0	0	0
4.5	0	0	0	0	0	0	0	0	0	0	0	0
6.0	0	0	0	0	0	0	0	0	0	0	0	0
8.0	0	0	0	0	0	0	0	0	0	0	0	0
10.0	0	0	0	0	0	0	0	0	0	0	0	0
12.0	0	0	0	0	0	0	0	0	0	0	0	0
14.0	0	0	0	0	0	0	0	0	0	0	0	0
16.0	0	0	0	0	0	0	0	0	0	0	0	0
18.0	0	0	0	0	0	0	0	0	0	0	0	0

a. MAP calibration

X-axis : engine speed(rpm)

Y-axis : petrol injection time (ms)

Z-value: correction of Gas injection time(%)

The green EspBox in MAP table display the engine RPM and relative position of the injection time.



MAP Table calibration ways:

Click and hold the left mouse button to drag the mouse to select which we need to modify the area, release the left mouse button pop-up dialog according to fill in the set values. Software "relative increase" and "absolute input" button, click on the "relative increase" button, fill in the values will be stacked to MAP each selected parameters (enter the same as the function of "relative increase"), click on the "absolute input" button, each parameter value of the selected area will be set to fill in the values.

If we need revise a single parameter in MAP table, double-clicking the parameter with the left mouse button will appear two arrows, arrow up is to increase, arrow down is to reduce, to adjust to desired values by clicking on the arrow.



b. main ratio: The correction percentage of gas injection time under all operating conditions (%)

c. MAP Reset

Restore the MAP data to factory Settings

d. Offset calibration

The gas injection time can be adjusted quickly according to the different petrol injection time, to meet the needs of engine under different conditions. It can solve the car engine under the same conditions but speeds under different conditions of motivation and emissions.



Plnj(ms) : petrol injection time (ms)

Glnj(ms) : Gas injection time (ms)

$$Glnj(ms) = Plnj(ms) * K (adj) + b (offset)$$

$$Glnj(ms) = Plnj(ms) * K (adj) + b (offset)$$

$$Glnj(ms) = Plnj(ms) * K (adj) + b (offset)$$

e. water temperature calibration



X-axis: reducer temperature

z-axis: Gas injection time revised (%), due to the different temperature under the same pressure but gas density difference, according to the change of the pressure reducer temperature, corresponding correction gas injection time.(at high temperature, gas density is small, low temperature, gas density)

°C: engine water temperature

% : gas injection time correction

According to adjusting the different engine water temperature, due to the water temperature decreases, the density of gas will increase and the gas injection correction will decrease accordingly. Guaranteeing the stability of engine in low temperature area is also beneficial to reduce the gas consumption.

f. Pressure calibration

燃气修正表

MAP/GasP(bar)	1.0	1.5	2.0	2.5
0.3	100	100	100	100
0.5	100	100	100	100
0.8	100	100	100	100
1.0	100	100	100	100

MAP表 偏移修正 水温修正 压力修正表 燃气温度修正表

转速	喷油脉宽	喷气脉宽	燃气压力	水温	ECU模式
0	0.00	0.00	0.00	0	油模式
OBD状态	长期修正	短期修正	MAP	气温	氧信号
Failed	0.00	0.00	0.00	0	0.00

X-axis : gas pressure (bar)

Y-axis : MAP pressure (bar)

Z value :correction value of gas injection time (%)

Because the gas output pressure is a dynamic process, the gas density increases relatively when the output pressure is high, so it is necessary to attenuate the gas injection time to make the lower output pressure to reduce the gas density. It is necessary to increase the gas injection time. CNG normal setting pressure is 1.8bar, LPG is 1bar.

g. T.Map calibration



X-axis :gas temperature (°C)

Z value :correction value of gas injection time (%)

As the gas is constantly flowing and changing , the gas temperature is not a constant value, when the temperature decreases, the density of gas will increase and the gas injection correction will decrease accordingly. The density of gas will decrease as the temperature increase, and the gas injection correction will increase accordingly.

3.2.4 More function:



a. Anticipate the Injection sequence: It has the option of none,1,2,3, adjusting through these 3 selection when injection pipe is longer or car jerk in constant speed.

b. Extra-Injection ident time: This function is to set up ECU identify additional injection time, when the injection time is less than the set value ECU judgement for additional injection.

Additional injection time set judgment method: in the process of cars in urgent to accelerating, the dot in the map table occasionally suddenly from the big Tinj.petrol suddenly jumping to the small Tinj.petrol, the observed value of Tinj is the additional injection time Value.

- c. Extrainj: It will filter out the petrol extra-injection signal when choose “cutting”. It will appear “Extrainj sensitivity”when choose “open”, ECU will calculate according to the petrol extra-injection signal, Injection time = Extra-Injection time + Extrainj sensitivity time.
- d. Gas Transition Adjust: deal with the injection time when rapid acceleration. In general, CNG less, LPG more. Adjusting coverage is 70%-130%, 70% means injection time decrease by 30%,130% means injection time increase by 30%
- e. Gas leakage alarming: It needs match with the gas leak sensor. When the gas leak, the switch will make warning until the leak signal disappear.
- f. Reset errors: It has the option of enable or disable, If Choosing “ enable”, It can clear the original ECU inner fault code.

3.2.5 Reset ECU:

To restore the ECU factory Settings

3.2.6 OBD learning:



OBD learning: used for setting OBD learning parameters.

- A. Real-time Cali. Choose Enable or Disable to open or close OBD learning function.
- B. Self-learning min: the maximum value of gas ECU injection time in the direction of decreasing is -20%, and the defaults is -10%
- C. Self-learning max: the maximum value of gas ECU injection time in the direction of increasing is +20%, and the defaults is +10%
- D. Self-learning signal

STFT: Short Term correction (%)

STFT_LTFT :Short Term correction (%) + Long Term correction (%)

3.2.7 OBD link:



OBD link: Gas ECU communicate with original ECU through OBD connector.

If the communication protocol of original ECU is not clear, you can choose "OBD automatic scanning" software try to connect to original ECU automatically. It will appear connection success prompt after the connection!

If the communication protocol of original ECU is clear, the corresponding communication protocol can be selected manually, which is more efficient.

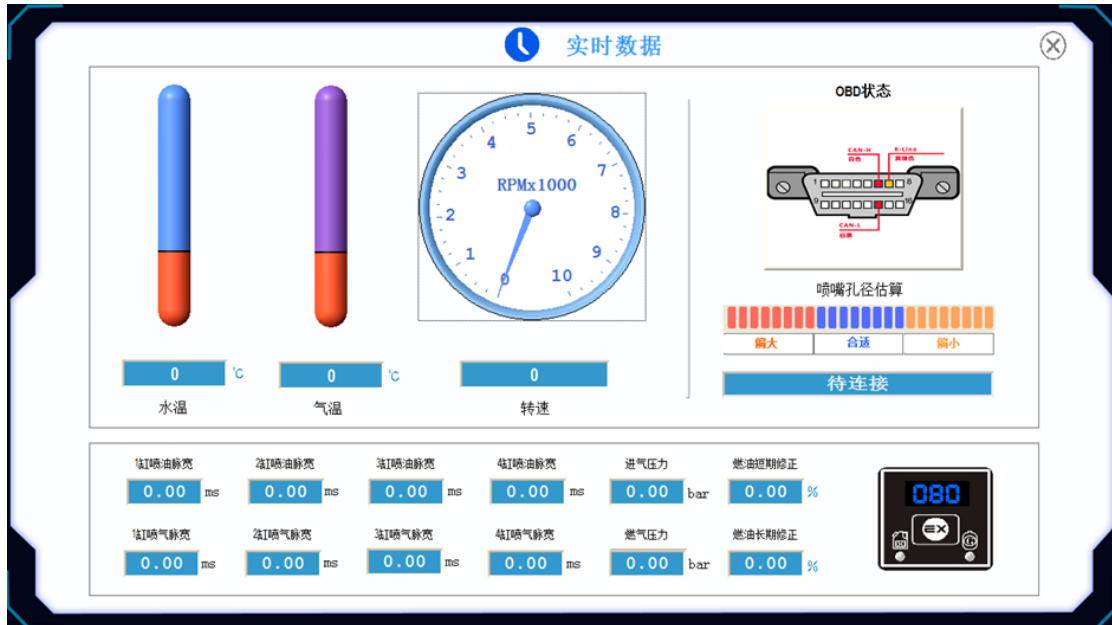
Pay attention: After connection, we must turn off the key and wait change over switch to go out, then open the key door, Only this way internal communication protocol of gas ECU be modified successfully. These are Normally OBD communication protocol method.

OBD address type: Generally, to use the defaults "physical address". If the above communication protocol is all fault connecting, you can modify the OBD address type to "broadcast address" to connect.

```
ISO15765_11B_500K_CAN
ISO15765_29B_500K_CAN
ISO14230_5B_KL
ISO9141_5B_KL
ISO14230_Fast_KL
```

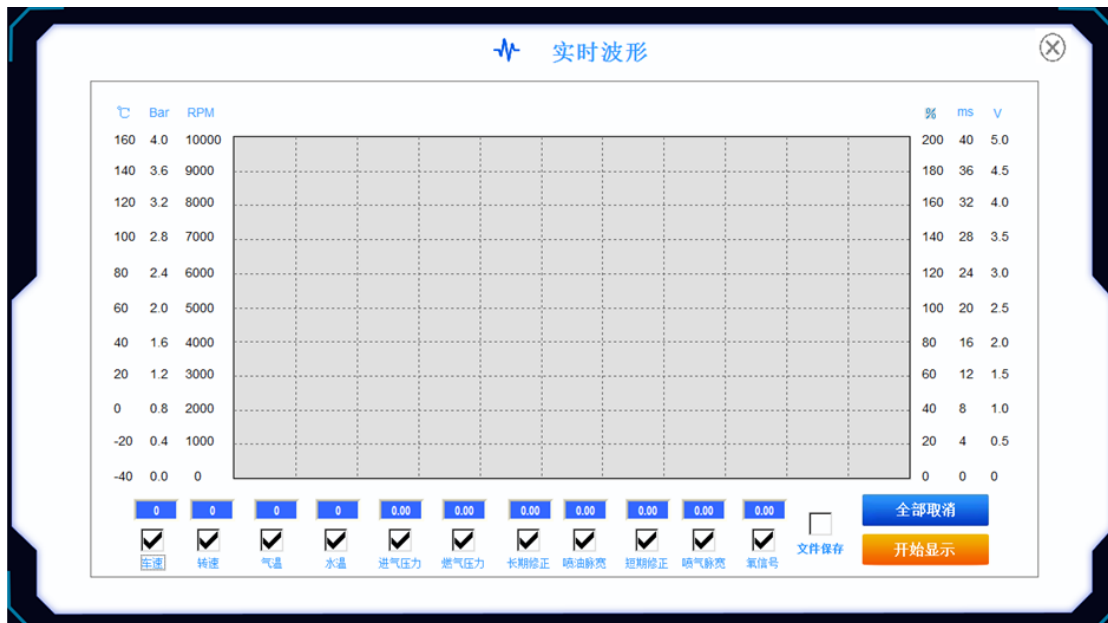
OBD communication methods on general for five as above.

3.3 Real-time data:



Engine runtime key parameters real-time display, easy to observe the engine operation.

3.4 Wave:



Selected the observe signals which we needed (check), the corresponding signal information will be displayed. If we check the "file save", and click "wave stop", the excel will appear, which will record the data from software.

3.5 Auto-calibration:



Auto-calibration : software and gas ECU automatic matching process of the vehicle.

The system will start the Auto –calibration while the water temperature is more than 60 °C . according to the instructions to run the throttle.

Before the Auto-calibration, it need do a preliminary matching the engine power with the hole of rail injector nozzle. As the following table.

Injector aperture and engine power corresponding diagram

CNG

Nozzle: Diameter: boquilla diámetro	Signal cyl. Power (kw)			
	10kw-15kw	15-20kw	20-25kw	25-30kw
VIT-V 2 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
VIT-V 3 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
MATRIX	1.8—2.0	2.0—2.4	2.4—2.6	NA
RAIL 2 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
RAIL 3 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
VALTEK 2 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
VALTEK 3 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
TOMASETTO 2 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
TOMASETTO 3 Ω	1.8—2.2	2.2—2.4	2.4—2.6	2.6—2.8

LPG

Nozzle: Diameter: boquilla diámetro	Signal cyl. Power (kw)			
	10kw-15kw	15-20kw	20-25kw	25-30kw
VIT-V 2 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
VIT-V 3 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
MATRIX	1.7—1.9	1.9—2.3	2.3—2.5	NA
RAIL 2 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
RAIL 3 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
VALTEK 2 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
VALTEK 3 Ω	1.5—1.7	1.7—2.1	2.1—2.3	2.3—2.7
TOMASETTO 2 Ω	1.6—1.8	1.8—2.2	2.2—2.4	2.4—2.8
TOMASETTO 3 Ω	1.7—2.1	2.1—2.3	2.3—2.5	2.5—2.7

3.6 Diagnosis



Fuel injection signal status: show gasoline injection signal collecting, whether it is right the green signal collected, red no collected signal.

Gas injection allowed: The button of selecting the corresponding cylinder can close the injection of this cylinder, and open the corresponding petrol injection signal. Green is normal injection, red is closed injection.

Fault code table: displaying the gas system component failure.

3.7 Save the data:



Save gas ECU data to PC.

3.8 load data:

To save PC data is loaded into the gas in the ECU.



3.9 Exit



Click Exit to close the software.



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Loyalty, diligence, cooperation, innovation and achievement are the soul of our company.