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# One． System Installation Considerations

1. Before installing this system, should remove the battery grounding wire. (Note: This operation may cause car phone, radio memory information clearance, anti-theft system lock stoning problem), need to inform users in advance.

2. After drilling should be used for anti-rust treatment.

3. Thread hole application silica gel to do waterproof treatment.

4. When wiring connection, the recommended soldering iron wiring head, to prevent the virtual connection.

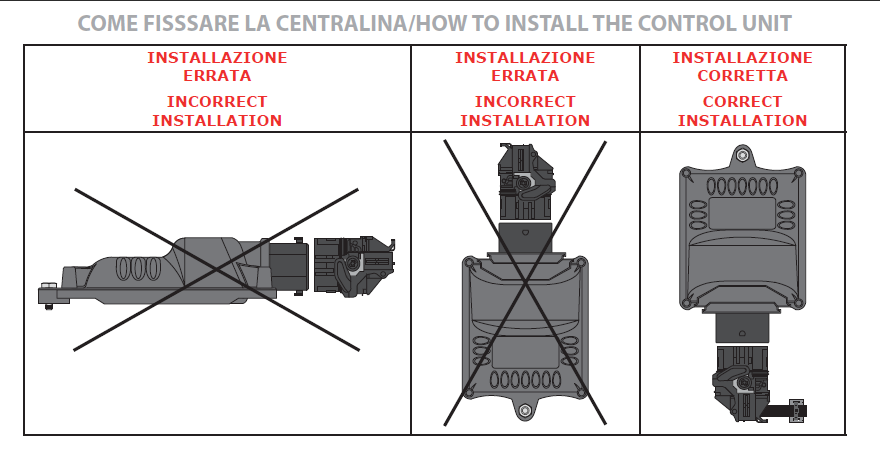
5. In line with the local government issued gas vehicle installation standards.

6. The installation should refer to the relevant standards, in order not to affect the main driving performance.

7. Ensure that the relevant insurance is disconnected before installing the computer.

8. It is forbidden to flush the engine after installation.

9. It is recommended that the ECU be installed vertically and the wiring harness is down to avoid the gas ECU flooding.



# Two． Calibration Related Software Installation

￭2.1 The minimum computer configuration requirements for installation software

1, operating system---Windows XP, WIN7, WIN8, WIN10.

2, Memory –--at least 512M of memory available.

3. Hard disk---at least 200M hard disk storage space when installing.

4, the display resolution---1024x768 above, 1960x1080 below.

￭2.2 Calibration Software Installation

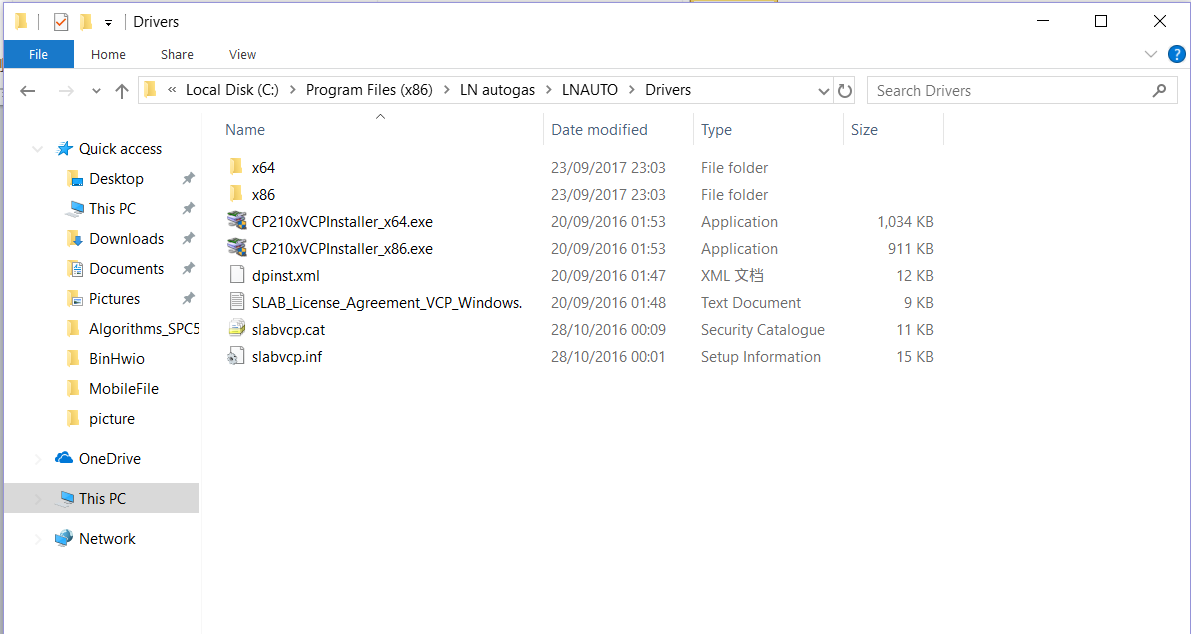
1. Access to genuine software from the formal channels, the company does not assume responsibility for the problems arising from the use of unauthorized software.

2. After getting open the installation file, double-click the software icon. Process, will be required to install in which directory, we recommend that you do not change the pre-set directory. When the installation is complete, the program icon is created on the desktop.

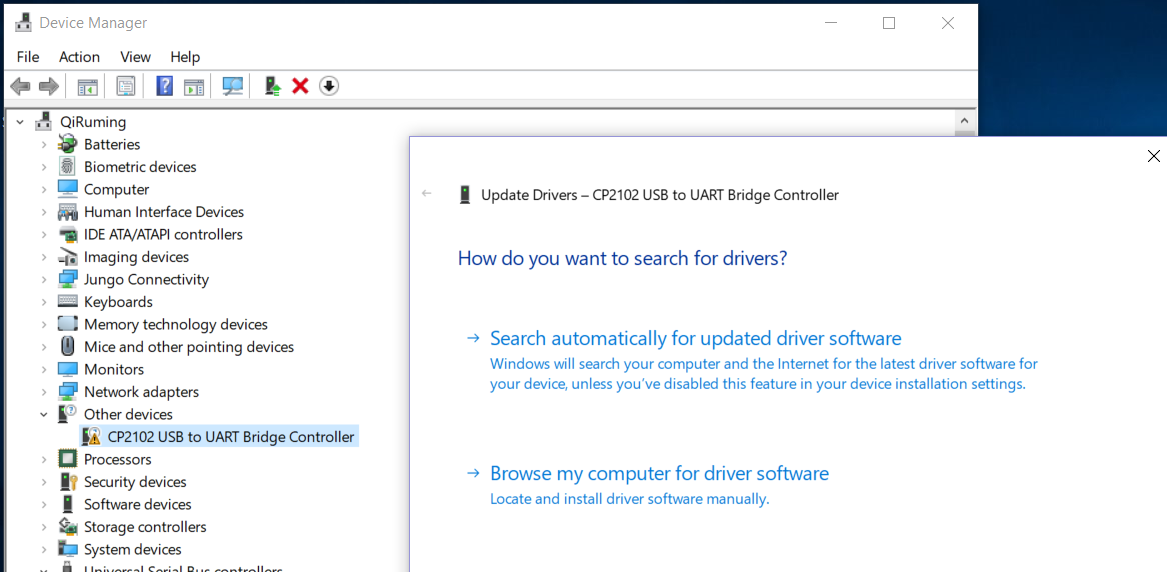
2.3 Data Cable driver installation

The calibration of the vehicle needs to be debugged through our special data line. The computer PC used to calibrate the vehicle needs to be fitted with a data cable driver. (Note: Special attention, the product supporting data line for the private data cable and other manufacturers system supporting data cable is not compatible, such as mixing can cause system damage.)

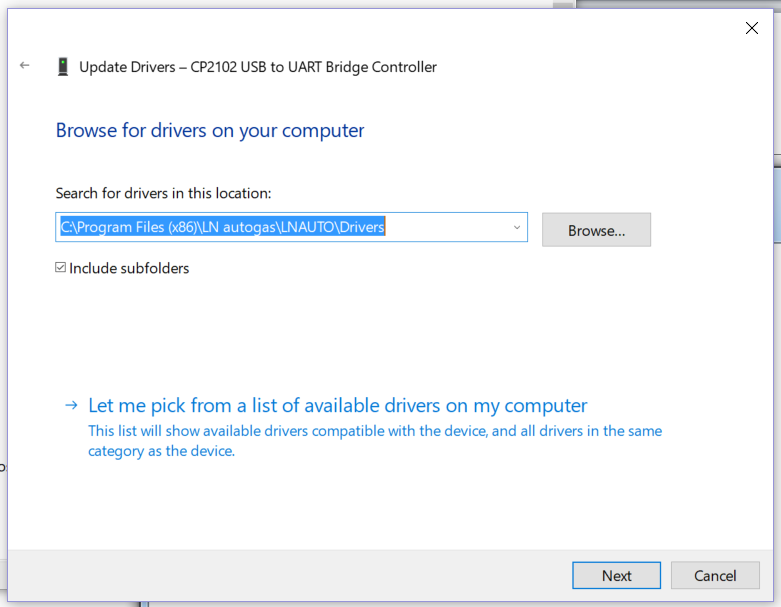
The data cable driver is placed in the Drivers folder under the Debug Software installation directory.



Open the computer Device Manager, as shown in Figure , the computer is not recognized.

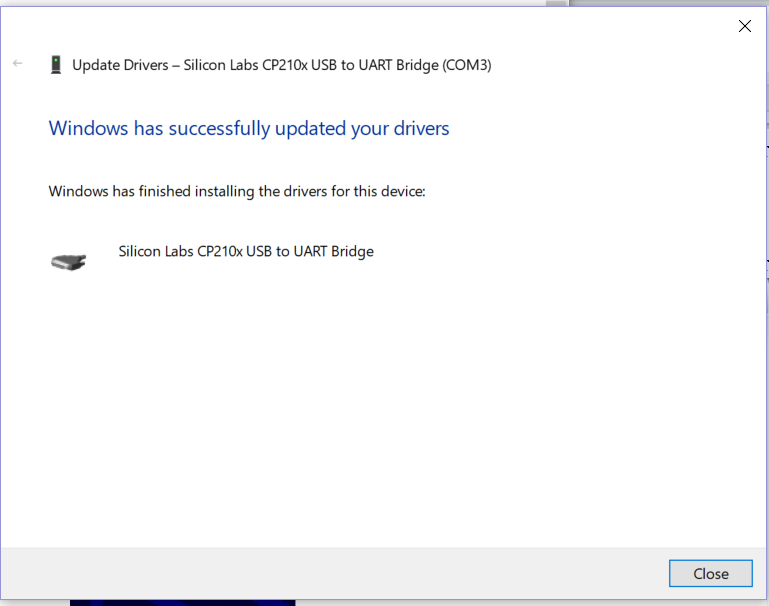


Click the "Browse my computer for driver software" button , and a dialog box appears, as shown in figure:



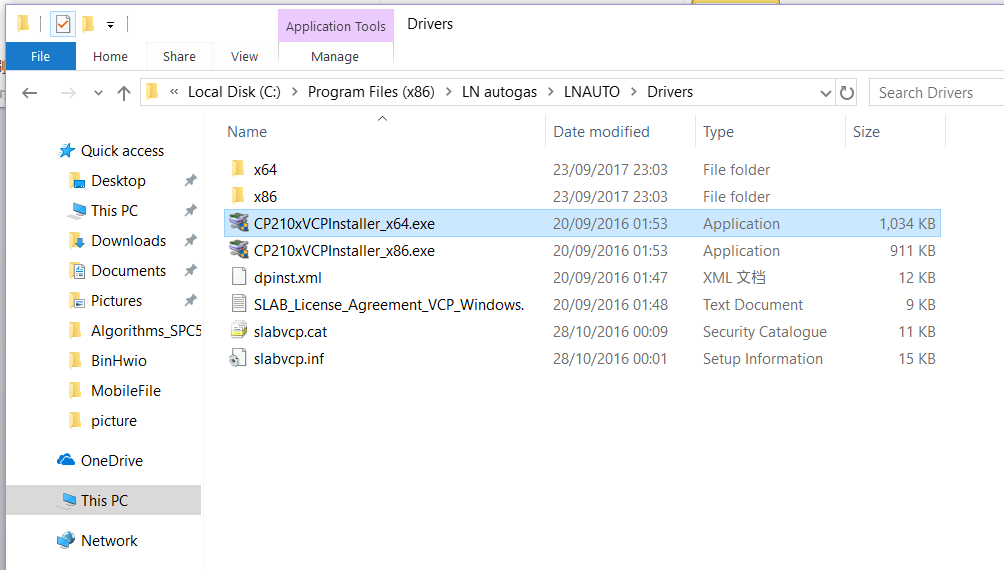
Click "Browse" to eject the image below, select the Drivers folder under the Debug Software folder, and click OK.

The following window appears when the computer searches for new hardware:

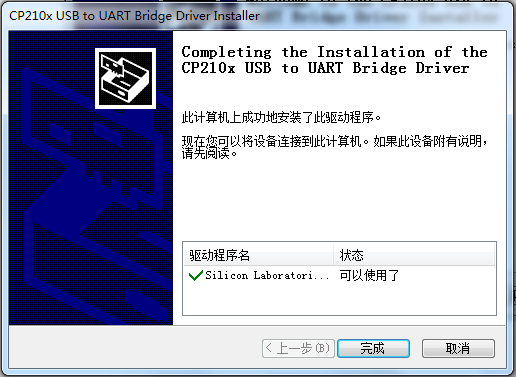


Click "Finish", the data line yellow light is lit and the computer appears in the following illustration, that is, the installation is successful.

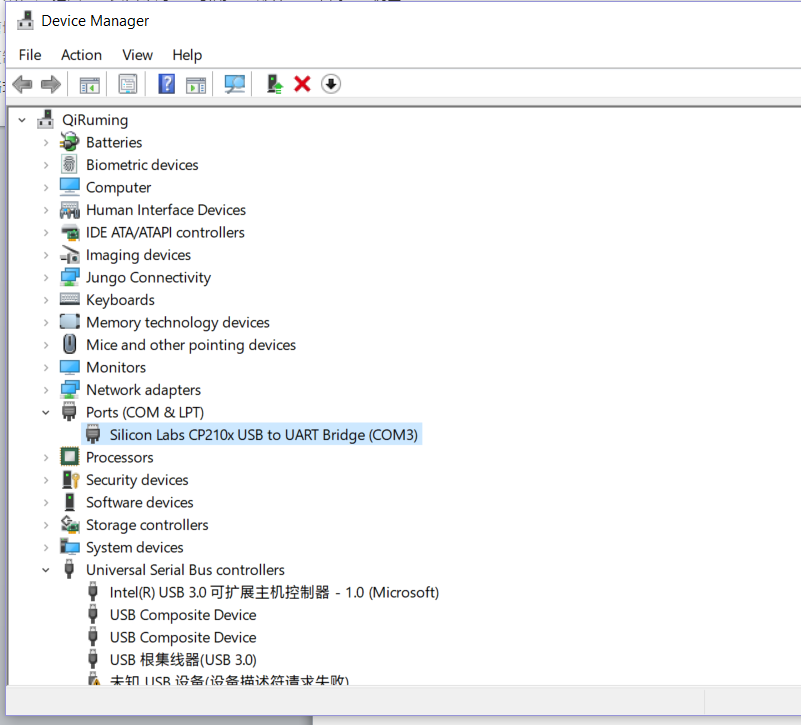
You can also take the active installation by double-clicking the installation file EXE under the driver folder, as shown in the following figure.



Double-click the exe

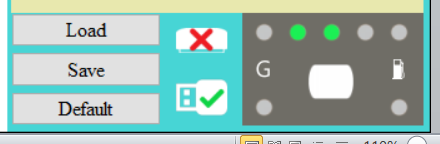
When the installation is complete, the following interface pops up

After you install the driver in either of two ways, you can see in the status bar that the new hardware is installed and ready to use, which indicates that the drive installation is complete.

When you open the My Computer Device Manager, a new port appears in the port, as shown in the following figure: 

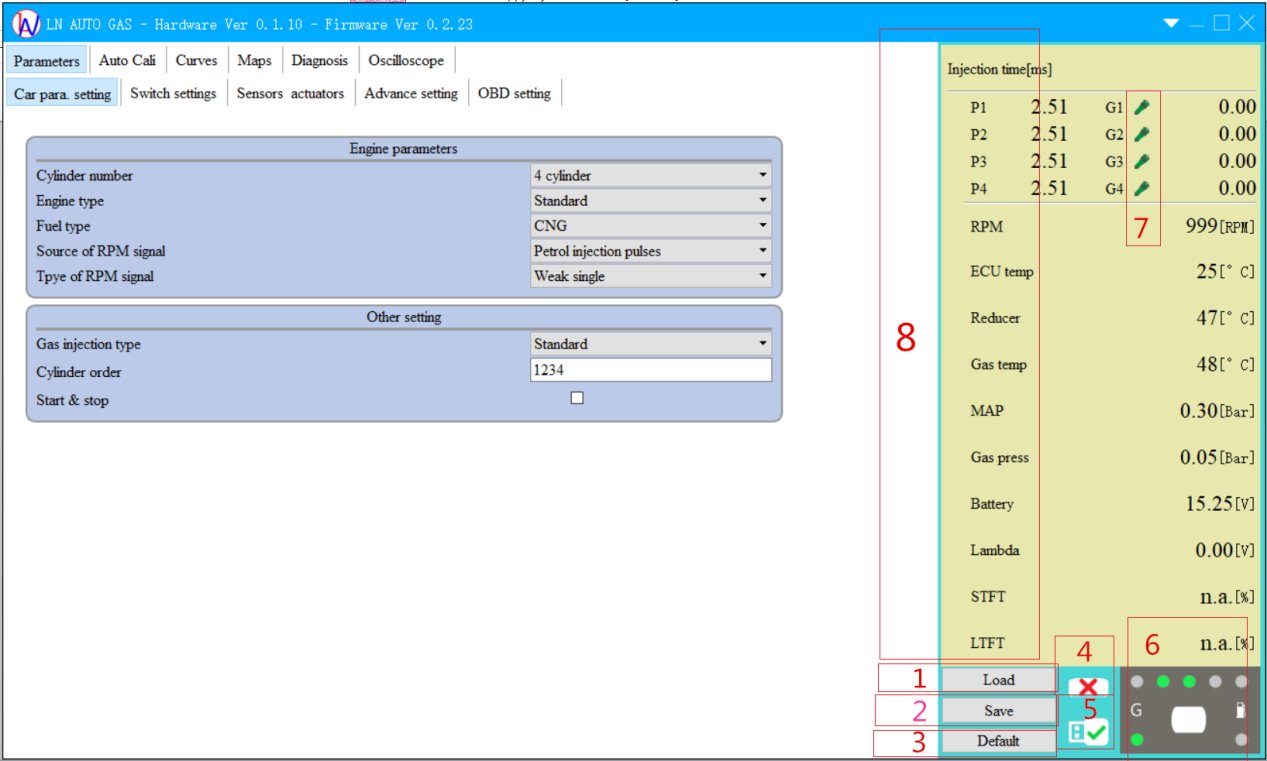
At this point, the data cable driver installation is complete.

Data line drive after installation, open the software to log in, the software in the lower left-hand corner of the USB icon in the "X" and will become "√"



# Three． Introduction to the application of calibration software

￭3.1 Main interface



1. Load

The "Load " button is designed to load the previously saved data directly into the ECU computer, which simplifies calibration for the same vehicle.

2. Save

The "Save " button function is to save the calibrated data to the local computer to facilitate later loading of similar models.

3. Default

The " Default" button is to Recovery gas ECU system data to factory settings.

4. OBD state

OBD status indication, if the vehicle has a OBD interface, gas ECU wiring harness and diagnostic interface correctly connected, if the successful connection of the vehicle bus, OBD icon "X", will become "√", indicating that the OBD connection of the gas ECU successfully.

5. Connection Status

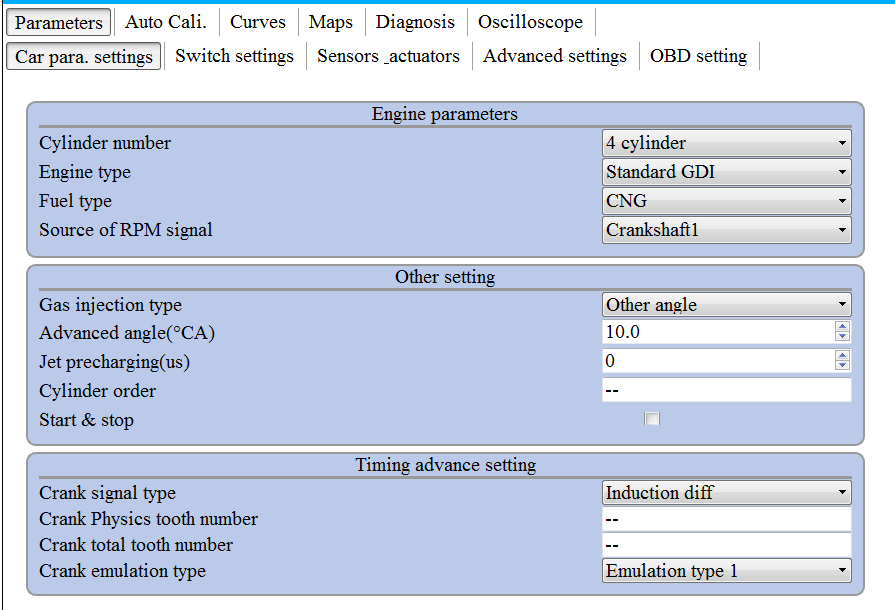
Correctly install data cable driver, connect data cable USB end to PC, the calibration port of the data line is connected with the gas ECU diagnostic port, when the ignition key of the vehicle is turn on, the debugging software will appear the progress bar of data loading when the connection is connected, and after the successful connection, the "X" in the icon becomes "√", if the USB end connection is normal, The gas ECU did not work in electricity or other problems the "X" and "√" in the icon flashed alternately.

6. Gas switch

The gas switch function on the debugging software is similar to the actual gas switch, above a row of 5 lights to indicate the remaining gas in the tank, the lower left-hand corner of the light steady represents the current gas state, flashing represents the state of the next right corner of the light steady represents the fuel state, the middle of the button represents oil and gas switch keys, Mouse clicks can be achieved fuel state and the state of transition, long press more than 3s can be forced to switch to gas state.

7. Gas enabled button

The gas-enabled button is a nozzle-shaped button, each cylinder corresponds to a button, the mouse clicks the button can toggle the effective state of the button, the green State, on behalf of the cylinder after the gas can be normal on gas, if the state of the gray represents the current cylinder is always in the state of on oil, this function to facilitate the search for gas fault.

￭3.2 Car para. settings 

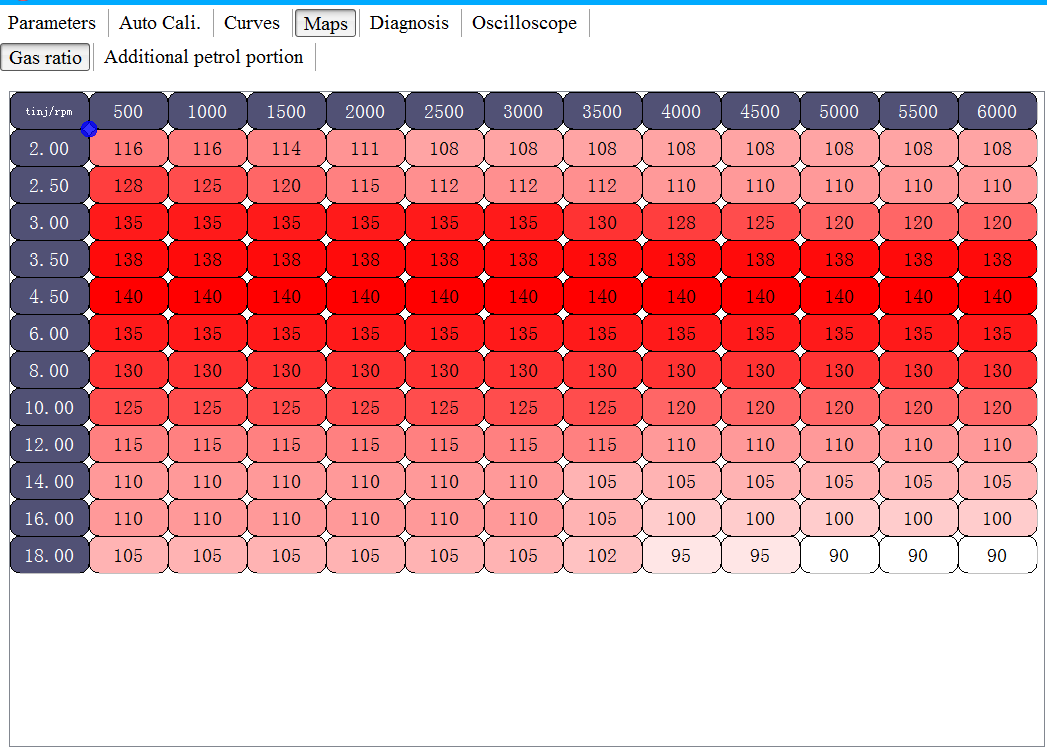
1. Cylinder number

According to the number of engine cylinders, for example, if the 4-cylinder engine to choose 4 cylinders.

2. Engine Type

Two options to choose from, if the engine is Turbo PFI engine select " Turbo ", if the engine is Turbo GDI engine select " Turbo GDI ", if the engine is normal PFI engine select " Standard ", if the engine is normal GDI engine select " Standard GDI ".

If select " Turbo GDI " or " Standard GDI " in “Maps” tab “Additional petrol portion” will appear for fuel injection quantity control 。



3. Fuel type.

Support CNG and LPG two kinds of fuel, depending on the different choice of fuel, switching fuel will revert to the current fuel corresponding to the default settings.

4. Source of RPM signal

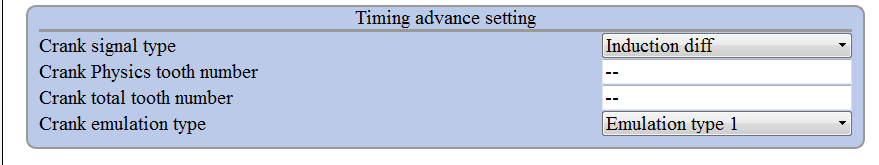
--Single coil ，Select this option when the speed signal is connected to the signal line of the independent ignition coil.

--Double coil ，Select this option when the speed signal is connected to the ignition coil of the two cylinders.

--3 cylinder， when the vehicle is a 3-cylinder engine and the gas computer speed signal is connected to the ECU's speed signal line of the gasoline engine selection.

--4 cylinder， when the vehicle is a 4-cylinder engine and the gas computer speed signal is connected to the ECU's speed signal line of the gasoline engine selection.

--Crankshaft1，When the crankshaft signal accesses ECU, Can obtain rotational speed from crankshaft signal。 IF “Crankshaft1”is selected “Timing advance setting” debug box will appear, If the crankshaft signal is recognized，“Crank Physics tooth number”and “Crank total tooth number” will display data .



--Crankshaft2，if “Crankshaft1”is selected, the crankshaft signal can not be recognized(“Crank Physics tooth number”and “Crank total tooth number” will display “--”), “Crankshaft2”can be selected to try again.

--Petrol injection pulses， when the speed signal of the gas ECU is not connected, to select this option, at this time the speed signal is from the nozzle signal acquisition, when the engine oil can be sliding when the engine speed update is not timely problem.

5. Type of RPM signal

Speed signal voltage lower than 6V "weak signal", the general Integrated Intelligent Ignition coil (4 line) ignition signal driven by weak signal, higher than 12V selection "strong signal, high-pressure packet ignition coil is the type of signal."

6. Gas injection type

--standard, no special case of the general selection of sequential injection. When the vehicle has accelerated jitter through calibration cannot be resolved when the choice of advance injection, the concept of advance injection is relative to the cylinder of the fuel injection signal, spray wide start in advance angle.

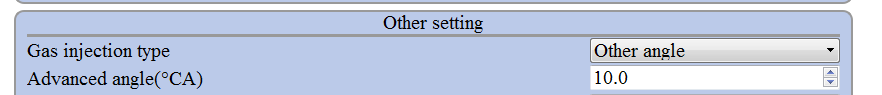
--Advanced injecton 1: Jet 90 degrees ahead of the crankshaft angle.

--Advanced injecton 2: Jet 180 degrees ahead of the crankshaft angle.

--Advanced injecton 3: Jet 270 degrees ahead of the crankshaft angle.

--Advanced injecton 4: Jet 360 degrees ahead of the crankshaft angle.

-Other angle: At this point, you can enter a reasonable jet advance angle in the “advanced angle (°CA)” option.



7. Cylinder order

Gas computer acquisition of the engine cylinder working order, under normal circumstances, 4-cylinder engine working order is 1342, if not this order can be prompted nozzle wiring problems.

8. Start&stop

With automatic start and stop function of the vehicle, need to check the election options to prevent engine downtime, the state of the gas computer changed.

9.Crank signal type

--Induction diff: For Inductive differential crankshaft position sensor.

--HALL: For Hall-type crankshaft position sensor.

--Induction single:

For Inductive sigle signal wire crankshaft position sensor(Most off Toyota Automotive).

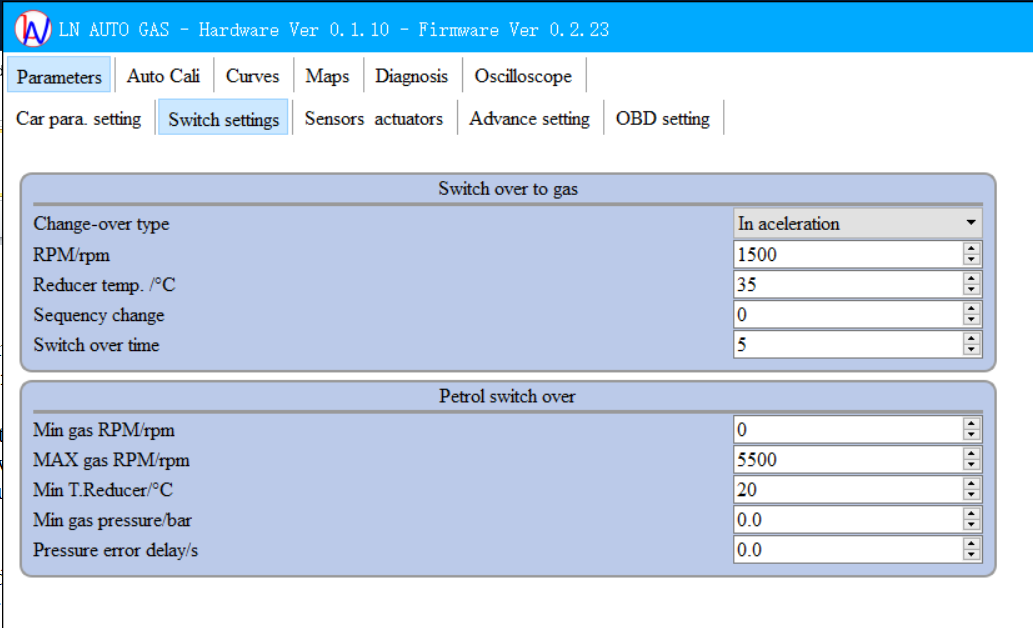
10.Crank emulation type :

--Emulation type 1:Default selection for timing advance function,if vehicles work normal. when we select “Emulation type 1”, timing advance function works when engine on gas。

--Emulation type 2:If vehicles work abnormal when it is on gas,we can select “Emulation type 2”. when we select “Emulation type 1”, timing advance function works when engine not on petrol.

--original signal: if it is selected , crankshaft signal direct output without andvance.

3.3 Switch settings



1. Change-over type

--In acelertion, when the gas ECU in the state to be turned, the conversion temperature reached after the speed of the rise in the process of exceeding the set speed, from the state to turn directly to the state of gas.

--In deceleration , when the gas ECU in the state to be turned, the conversion temperature reached, waiting for the conversion speed to reach the set value, and then if the speed down again, the speed of the maximum speed after the reduction of 100 RPM for oil and gas loading.

2. RPM/rpm

Oil and gas conversion speed threshold, accelerated conversion, exceeding the set threshold, oil and gas conversion. Deceleration conversion, first higher than this threshold and then deceleration process of oil and gas conversion.

3. Reduce temp./℃

Oil and gas switching temperature valve value. Over the setting of water temperature, in order to carry out the transfer of gas, according to the temperature and vehicle conditions in different places to choose, the principle is that when the temperature reaches the conversion time is relatively smooth, low temperature conversion may cause the conversion of the phenomenon of instability.

4. Sequency change

When the vehicle from the oil state to the gas, the engine cylinder to switch, one cylinder to the gas, after the input data of the number of cycles after the conversion of the next cylinder, and so on, and so on, until all cylinders are all burning gas.

5. Switch over time

Gas ECU will be after the start of the engine waiting time after the set time to do the speed of the water temperature and other conditions to judge the transfer gas.

6. Min gas RPM/rpm

When the engine is working in the gas state, if the engine speed is lower than the set minimum speed, the ECU control the vehicle from the gas switch to the fuel state, at this time the switch state lamp or in the gas state, such as the speed of return to a reasonable range after the automatic conversion to the gas state.

7. Max gas RPM/rpm

When the engine is working in the gas state, if the engine speed is higher than the set maximum speed, the ECU control the vehicle from the gas switch to the fuel state, at this time the switch state lamp or in the gas state, such as the speed of return to a reasonable range after the automatic conversion to the gas state.

8 Mini T.Reducer/°C

When the vehicle is in a gas state, if the temperature of the pressure reducer is detected to be lower than the minimum water temperature, the ECU controls the vehicle switching from the gas to the fuel state.

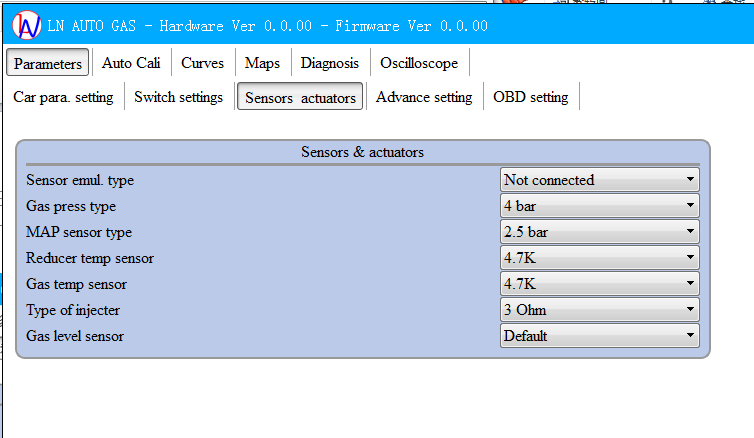
10. Min gas pressure /bar

When the gas pressure is detected below the set value, the vehicle will be converted from the gas state to fuel state, the gas indicator cycle flashing, buzzer alarm, in the automatic calibration process system will learn gas pressure, and the minimum pressure setting value is generally half of the work pressure.

11. Pressure error delay/s

Because the gas system works in a low temperature environment, especially when the use of fuel for LPG, due to poor gasification and other reasons, the system will be sufficient fuel surplus to detect the gas pressure below the minimum pressure, if not set this parameter may be mistaken for fuel exhaustion into the state of fuel. Setting the delay time is to prevent such a situation from happening.

3.4 Sensor actuators



1. Sensor emul. type

If the system is not connected to the oxygen sensor to choose not to connect, when the system is connected to the oxygen sensor can be selected according to the type of oxygen sensor different options, select the right side of the display area of the oxygen sensor voltage will also be displayed in real time.

2. Gas press type

4bar is generally selected if you choose a pressure differential sensor with a MAP sensor. Select 4.5bar if it is gas injection rail integrated gas temperature&pressure sensor pressure.

3. MAP sensor type

If you select a dual-channel pressure differential sensor with a manifold pressure signal, General direct selection of 2.5Bar, if the selection of a rail integrated pressure sensor which have no MAP sensor, at this time the manifold pressure signal will need to choose from the vehicle original ECU sensor. Due to different types of manifold pressure sensor type, we can select other selection such as 1.0 Bar 1.5Bar 2.0Bar. If the pressure is around 1.0 bar when the vehicle is shut down, and if the pressure is around 0.35 bar when the vehicle is idling, the selected option can be considered correct.

Simulation signal:

When using an injection rail integrated pressure sensor, The engine uses an intake flow meter without an intake pressure sensor. Unable to obtain MAP pressure from the original ECU. At this point you can choose this option. Select this option to calculate the MAP pressure signal based on the injection pulse width of the original vehicle, the input box with maximum pulse width and minimum pulse width will need to be entered as shown below.



You can observe the idling pulse width and rapid acceleration pulse width to fill in.

4. Reducer temp Sensor

Select the appropriate option based on the resistance of the temp sensor selected by the reducer.

5. Gas temp sensor

Select the appropriate option based on the resistance of the gas temperature sensor.

6. Type of injector

Select the appropriate option based on the resistance of the gas injector.

7. Gas level sensor

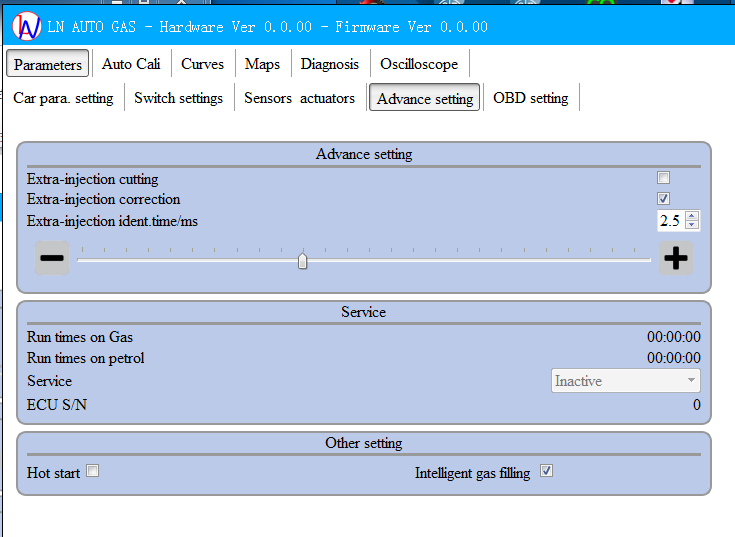
--Default，the system supporting CNG pressure gauge, select the "Default" option.

--90 Ohm，if the LPG "0~90 Ohm" level meter, select the "90 Ohm" option.

--Not std，if it is another type of pressure gauge, if the pressure increases the type of signal voltage, then choose" Not std ". Each gas interval can be calibrated by an input frame.

--Not std. inverted，if it is the other type of pressure gauge, if the pressure increases the type of signal voltage decrease, select " Not std. inverted ". Each gas interval can be calibrated by an input frame.

3.5 Advanced Settings



1. Extra-injection cutting

After checking the options, the system will filter out the extra fuel pulse width, which will still be injected into the cylinder without being translated into a gas jet pulse width.

2. Extra-injecton correction

This option indicates that the pulse width of the extra jet will not be filtered out and that the normal pulse width is truncated and the gas jet pulse width is triggered.

3. Extra-injection ident time/ms

This option enters the pulse width size that represents the recognition time of the additional injection, and the pulse width less than the set value is considered to be an additional injection, and conversely, if the setting value is exceeded, it is considered to be the main pulse width.

4. Progress bar

The progress bar is an additional correction factor that adjusts the pulse width identified as an additional injection, and the left pull indicates a reduction of the gas jet volume of the extra jet and a correction to the right. If there is instability in the acceleration process, you can adjust the progress bar.

5 Running time on gas

The running time of the vehicle in the state of burning gas.

6. Running time on fuel

The running time of the vehicle in the state of burning oil.

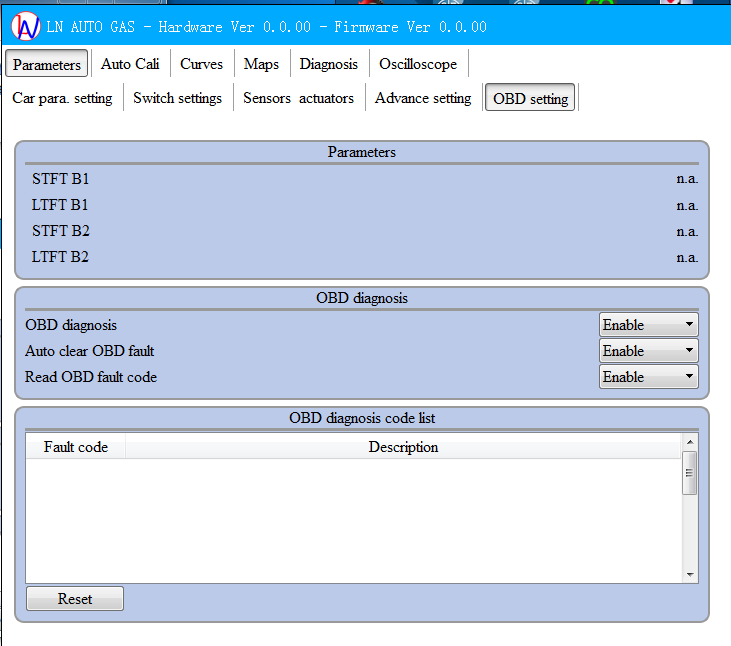
7. Hot start

Start this function, when the water temperature is over the switch standard, start the vehicle immediately switch the gas.

8. Gas-adding self-identification

In the case of gas exhaustion, the vehicle is in the condition of adding gas, after the selection of the option, the vehicle automatically converted to gas after the gas to be turned state.

3.6 OBD settings



1. STFT B1

The OBD signal line is connected and the OBD is in the connected state, showing the current BANK1 short-term correction of the original vehicle.

2. LTFT B1

The OBD signal line is connected and the OBD is in the connected state, showing the current BANK1 long-term correction of the original vehicle.

3. STFT B2

The OBD signal line is connected and the OBD is in the connected state, showing the current BANK2 short-term correction of the original vehicle.

4. LTFT B2

The OBD signal line is connected and the OBD is in the connected state, showing the current BANK2 long-term correction of the original vehicle.

5.OBD diagnosis

To enable fault diagnosis, the gas ECU sends data to the ECU of gasoline to obtain the OBD information of the original vehicle. Conversely, when an option is prohibited, the OBD information of the original vehicle is not obtained.

6. Auto clear OBD faults

Select "Enable", after the vehicle get some gas-related OBD fault, gas computer will actively remove these fault code, so that the dash board fault lights do not light. (gas-related failures include air-fuel ratios, oxygen sensors, ternary catalysis-related failures)

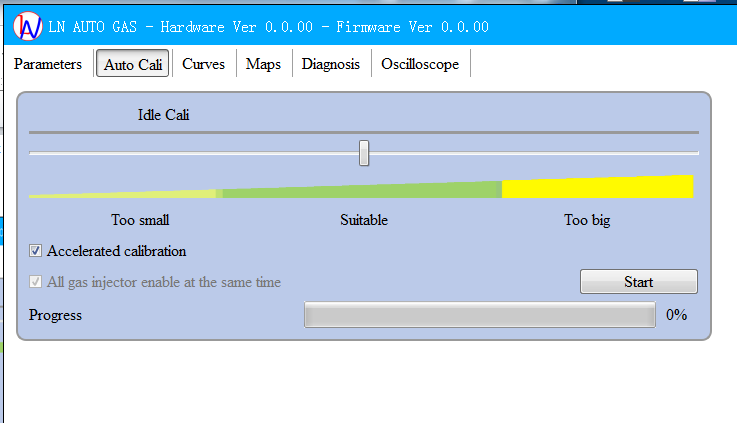
7. Read OBD fault code

To enable fault diagnosis, the gas ECU sends data to the ECU of gasoline to obtain the fault information of the original vehicle. Conversely, when the option is forbidden, the OBD fault information of the original vehicle is not obtained.

8. OBD diagnosis code list

After obtaining the OBD fault information of the vehicle, it is displayed in the Fault Code information list, which contains the fault code and the description of the fault.

3.7 Auto Cali.



1. Accelerated calibration

Checked condition: Close all the vehicles with electrical appliances, the water temperature reached 60 degrees Celsius, step on the accelerator pedal, the speed of stability to 2500~3000 turn.

Cancellation conditions: the car off all the use of electrical appliances, the water temperature reached 60 degrees Celsius, the vehicle at idle speed, the speed of stability in the idle state.

2. All gas injector enable at the same time

After checking, in the process of automatic calibration, the fuel state is transferred to the gas state process, all nozzles work together to convert. If you cancel the check, the fuel state to the state of the gas-cylinder conversion process, this can reduce the risk of flameout in the conversion process, mainly for the non-accelerated calibration process.

3. Start button

To ensure that the corresponding calibration conditions, click "Start", the system began to automatically convert fuel gas state, to achieve automatic calibration.

4. Progress bar

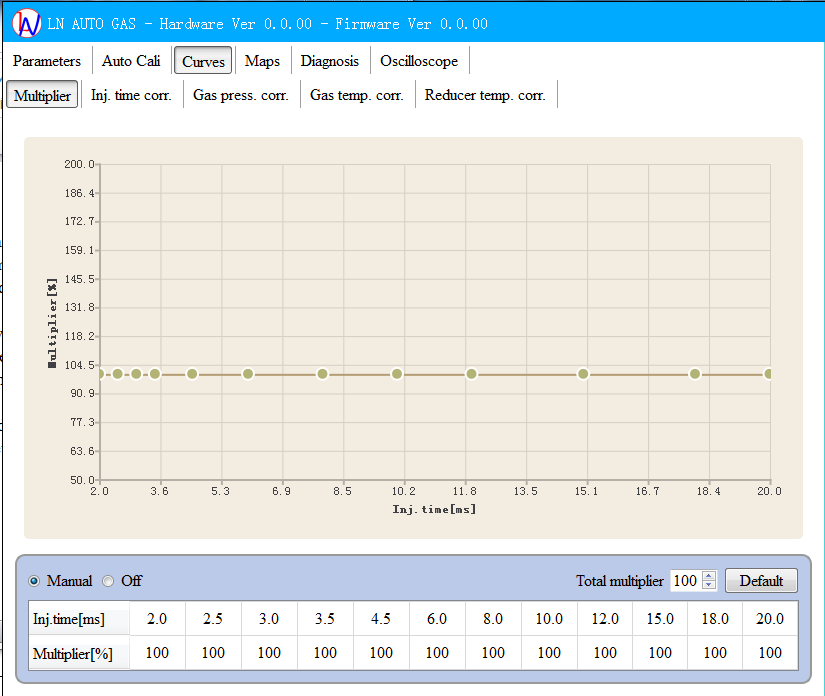
A progress bar is a sign that shows the process of calibration.

5. Drag bar above

After the automatic calibration is completed, according to the current gas working situation indicates the current nozzle aperture, the left side is small diameter, the right side of the large size.

3.8 curves

1. Multiplier



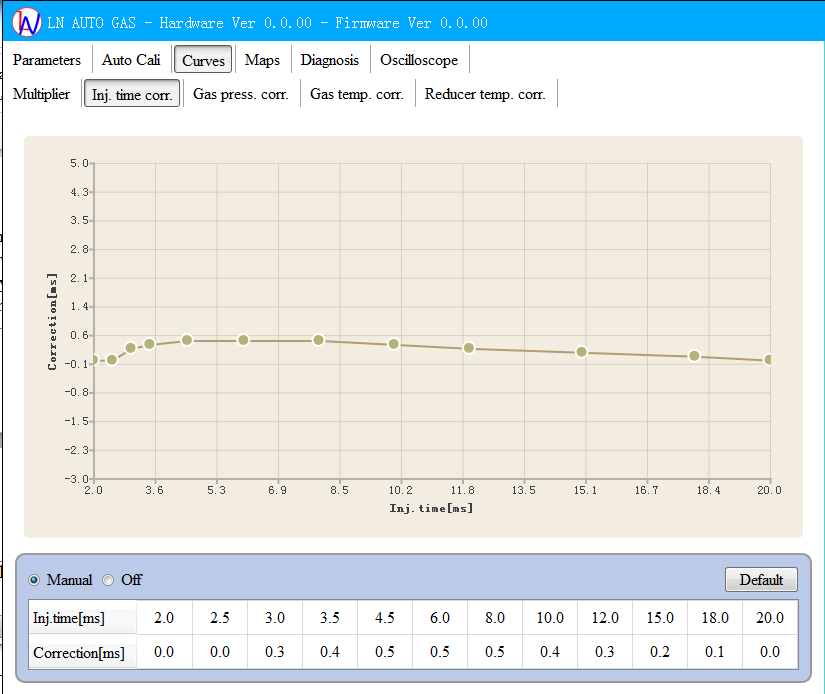
Pulse width ratio is according to different pulse width regulation of gas pulse width ratio, 100 representatives does not revise, 110 represents the jet volume increases or decreases 10% ((110-100)/100=10%), 90 represents the jet volume reduction 10% ((90-100)/100=-10%);

The whole proportion is to revise the proportion of gas in the whole working condition, the value 100 is not amended, 110 represents the jet volume increase or decrease 10% ((110-100)/100=10%), 90 represents the reduction of the Jet volume 10% ((90-100)/100=-10%);

The default button, when clicked by default, restores the curve to the default data.

Manually, select the mode to enable the correction, turn off, and select the mode to turn off the correction.

2. Inj.time corr.

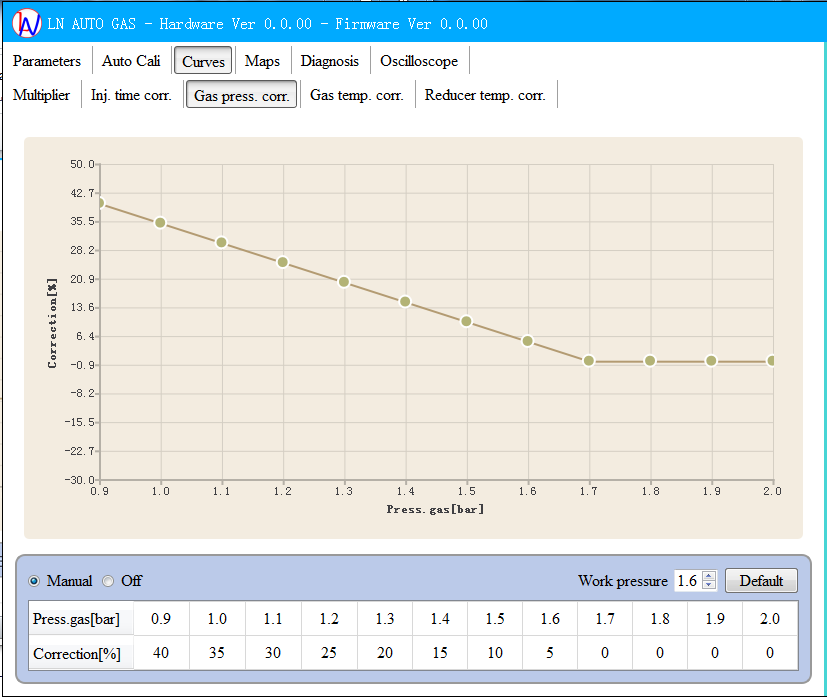


Pulse width correction is based on different pulse width to adjust the pulse width of the gas, 0 representatives do not compensate, 0.5 represents the jet volume increase or decrease in the 0.5ms, -0.5ms on behalf of the jet will be reduced by 0.5ms;

The default button, when clicked by default, restores the curve to the default data.

Manually, select the mode to enable the correction, turn off, and select the mode to turn off the correction.

3. Gas press. corr.



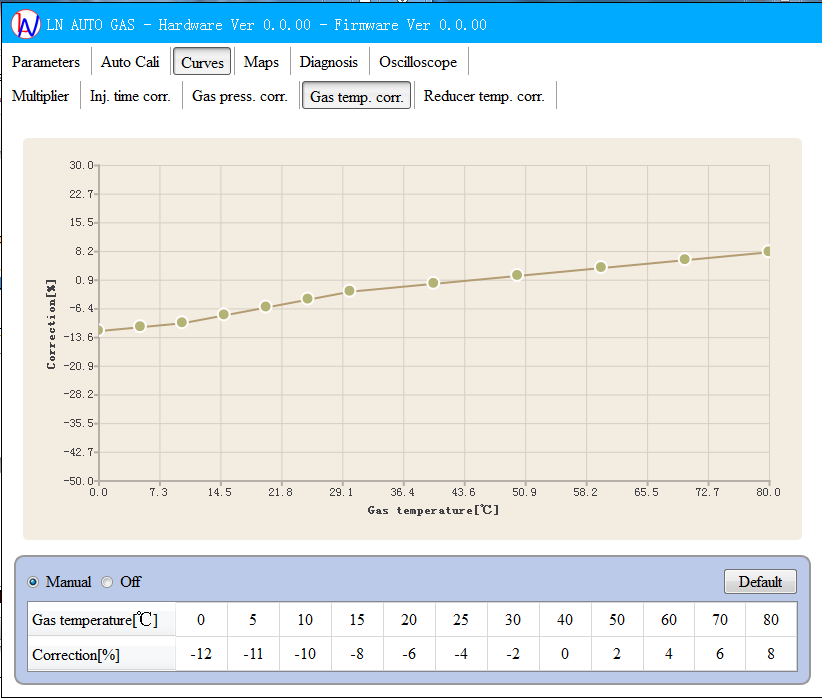
Working pressure, this input box needs to enter the actual operating pressure of the current system, automatic calibration will update this value.

Pressure correction, curve table can be calculated according to the "work pressure" input of the value of the automatic calculation of the correction, the effect is low pressure to increase the extra compensation to make up for the low pressure caused by the shortage of jet.

By default, the button is able to revert to the default value of this curve.

Manually, select the mode to enable the correction, turn off, and select the mode to turn off the correction.

4. Gas press.corr.

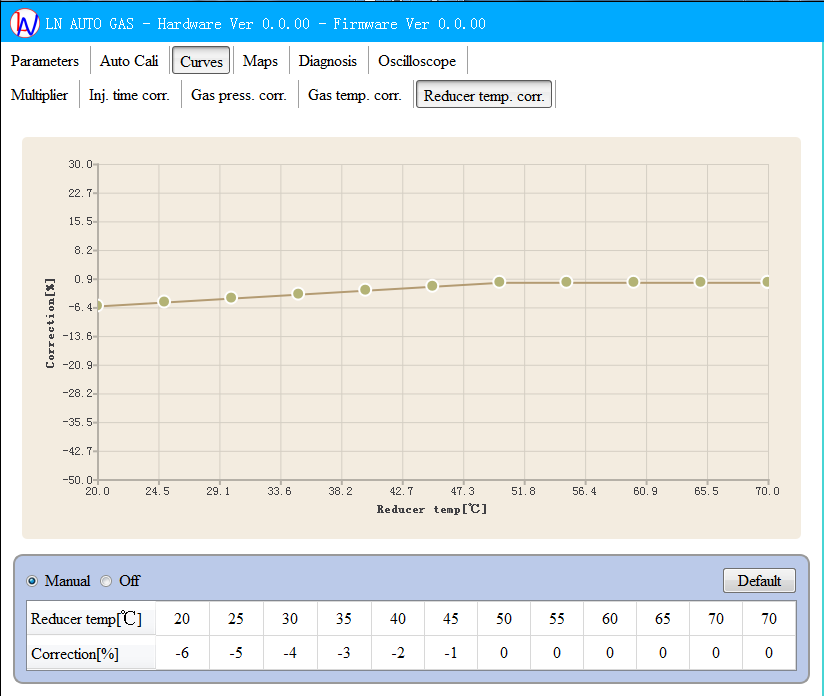


Gas temperature correction, according to the different temperature adjustment of gas correction, 0 of the representative does not amend, 5 represents the jet volume increase or decrease in the 5%, -5 representative jet will be reduced by 5% in the temperature;

The default button, when clicked by default, restores the curve to the default data.

Manually, select the mode to enable the correction, turn off, and select the mode to turn off the correction.

5. Reducer temp.corr.

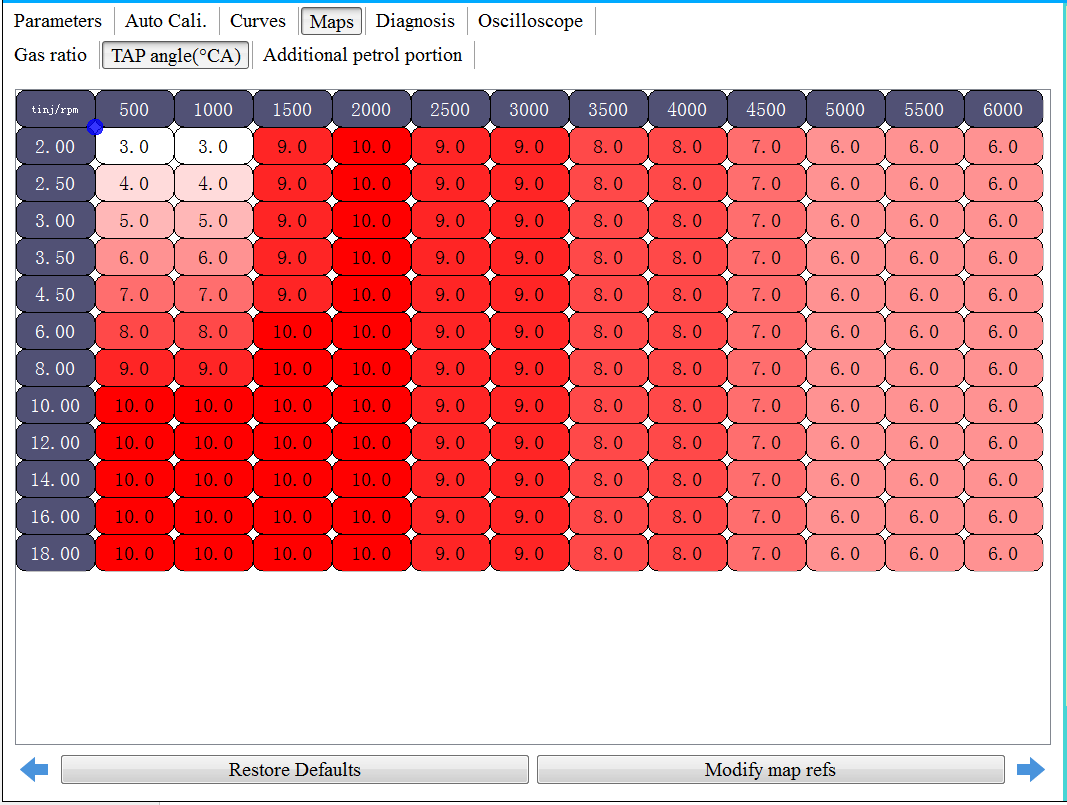


Reducer temperature correction, according to the different water temperature regulation of gas correction, 0 of the representative does not amend, 5 represents the jet volume increase or decrease in the 5%, -5 representative jet will be reduced in the temperature of 5%;

The default button, when clicked by default, restores the curve to the default data.

Manually, select the mode to enable the correction, turn off, and select the mode to turn off the correction.

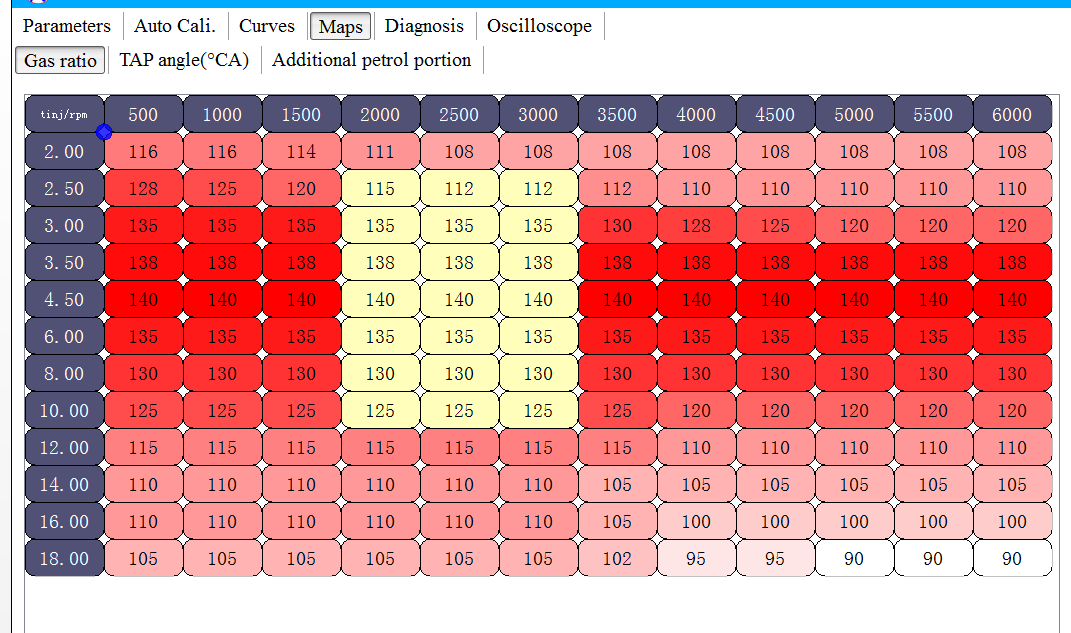
3.9 Maps

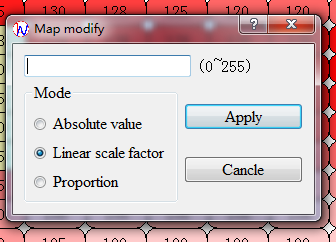


1. Gas ratio

As shown above, the main interface of the map chart, where the blue moving coordinates follow the engine speed and pulse width dynamically, which can indicate the position of the current operating point.

The 144 points in the icon can be modified, the number represents the current operating conditions of the jet proportional factor, 100 represents not modified jet ratio, 110 represents the current jet pulse width relative to the fuel injection pulse width increased by 10%, 90 represents the current jet pulse width relative to the injection pulse width reduction of 10%. Click to drag to select the range area you want to modify, and the selection will turn yellow, as shown in the following figure

The following pop-up window appears when you press the Enter key



Absolute Value: Modified value = Enter numeric value.

Linear scale factor: the modified value = before the modified + input value.

Proportion: Modified value = value before input \* Input value/100

Click Enter or confirm that the key changes successfully.

2 Restore Default

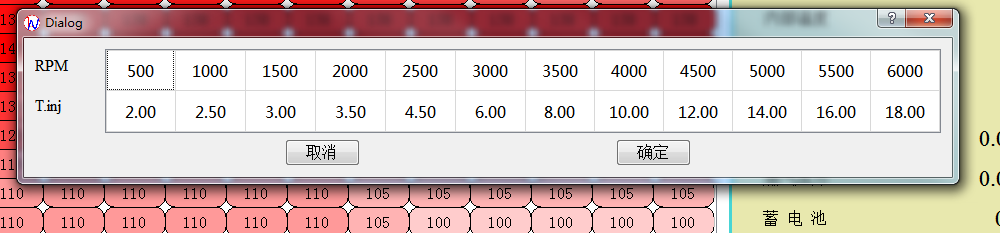
Click this button to restore all data in the chart to the factory status icon data.

3 Undo Button

The left arrow in the lower left corner is the modified undo modifier button, and the right arrow in the lower right corner is the Undo function button.

4 Modifying map refs

The table has XY two axes, the x axis represents the engine speed axis, the Y axis is the engine's pulse width axis, which has 12 values respectively, according to the vehicle actual situation may need to adjust the default axis parameter, clicks "The Map Table Head Modification" button to call up the following modification dialog box.



With the mouse click need to modify the data selection data, enter new data press ENTER to complete the modification, you need to note that the revised data needs to be incremental trend, which cannot be reversed.

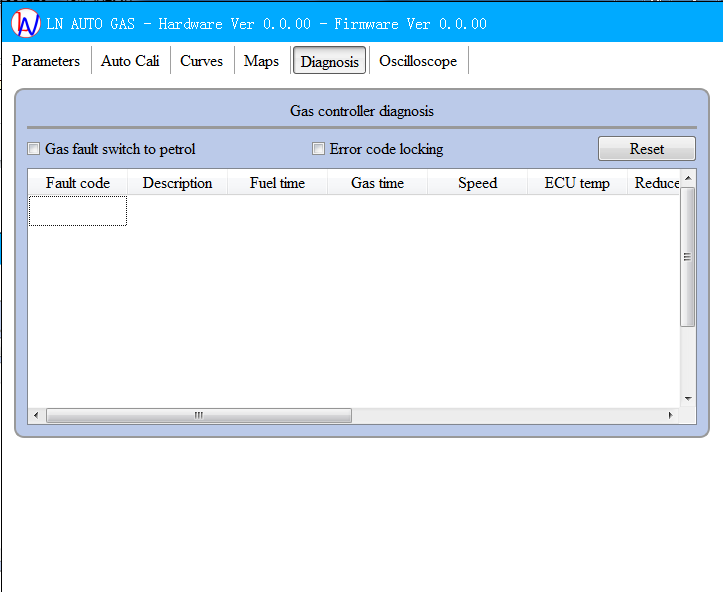
2. TAP angle(°CA)

Adjust ignition advance angle，the specific operation is the same as the previous MAP。

3. Additional petrol portion

This tab is for GDI vehicles，when the vehicle is on gas，adjust this MAP can control the amount of fuel injected into the engine .The data in the MAP table represents the remaining pulse width of the engine,the data unit is ms. If the data in the table exceeds the pulse width in the coordinates，in this condition, the engine will work in pure oil. If the remaining pulse width in the chart is smaller than the pulse width in the coordinates, The part of the true pulse width minus the pulse width in the chart is converted to gas. the specific operation is the same as the previous MAP。

3.10 Diagnosis



1. Gas fault switch to petrol

After the option box has been clicked √, when the gas system have some serious failure, control the gas system switch to the fuel. and record the value of the fault code and real-time data corresponding to the time.

On the contrary, the gas system only records fault code and real-time data does not convert to fuel state.

2. Error code locking

Error code locking, check the option system records of the fault information will not be cleared, otherwise the fault information can be cleared by the “Reset” button.

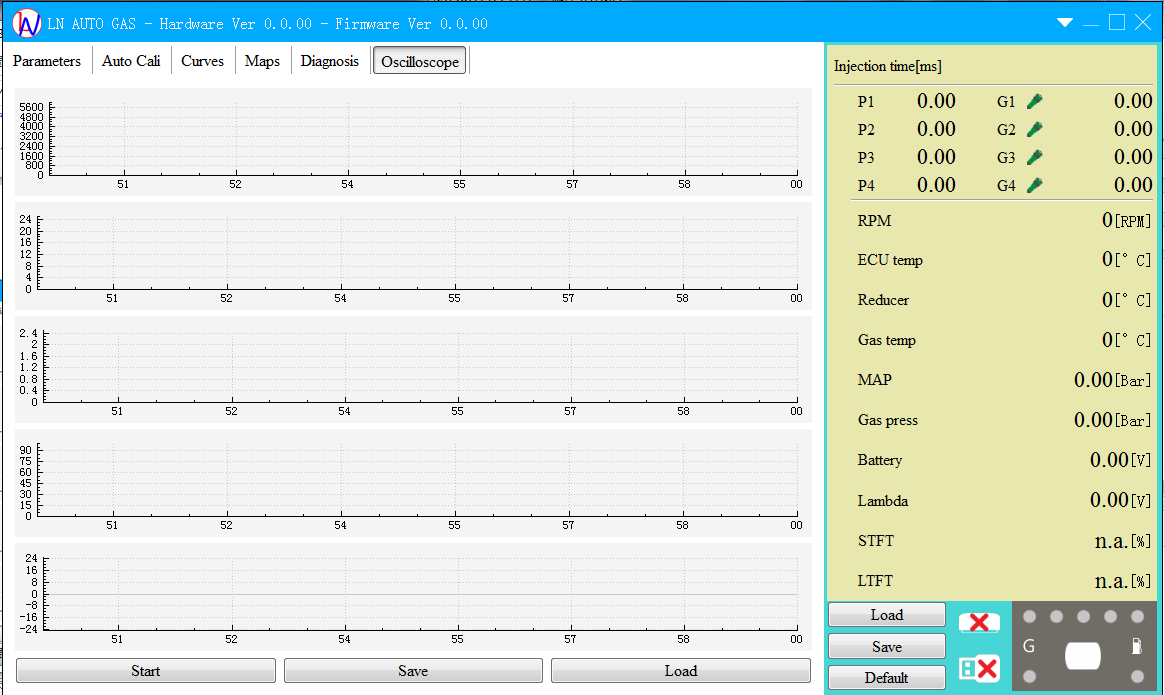
3. Reset

Click to clear current and historical faults. If the real failure is not eliminated, the fault code will appear soon after the click is removed.

4. Display list

This list shows the current gas fault information and historical gas fault information (previously recorded data).

3.11 Oscilloscope



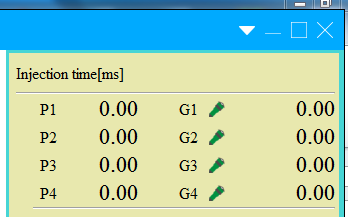
A list of parameters that can be displayed as a waveform in an oscilloscope. Click on the right side of the variable name, this variable appears in front of an "X", and the variable color change, at this point in the scope of the interface will show the corresponding color curve (need point Start button operation).

Start button, the Start button becomes the Stop button displayed in the diagram, the ECU can begin to display the selected parameter waveform.

Save button: Click the Start button to start recording waveforms. When the "Save" button is clicked, the ECU saves the selected data from 0 seconds to the click "Save" moment.

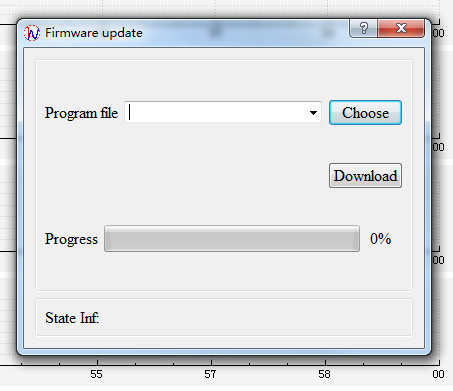
Load button: You can display the saved data on the oscilloscope.

3.12 Menu Bar



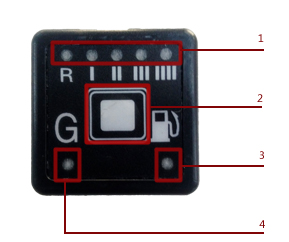
The upper right corner of the software has inverted triangle symbol, click to see the Pull-down menu, in which can be set language and firmware upgrades and other operations.

The firmware upgrade pop-up box is as follows:



Click the "Browse" button, find the firmware file to upgrade (“fw” suffix), on the system on the situation of electricity , click on the "Download" button, you can do firmware upgrades, the progress bar will be automatically run according to the download progress, and state information will prompt the current running state.

# Four． Instructions for using the switch

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1 Gas level display lamp: When the gas is full 5 indicator lights are all on, with the when gas reduced, from right to left turn off, until the red light. If you continue to use gas exhausted, the vehicle will switch to fuel state,and 5 lights turn on one by one, then turn off and repeat ; If the gas system have some errors, ,the system will be converted to fuel, 5 indicator intervals turn on or off.

2. Oil and gas switch button： Short press can switch the system State, fuel state switch to wait for the conversion state, or wait for the transition state switch to fuel state; If the length of more than 3S, the system will be forced into the gas state.

3. Fuel indicator, the fuel of the vehicle is long bright, the rest of the state are off state.

4. Gas indicator, the vehicle gas state when the long light, waiting for the conversion of fast flashing, fault state slow flashing, fuel state.

Switch buzzer usage instructions:

1. When the vehicle starts, the switch will ring a sound, all lights on the light, for self-test

2. The gas was detected, beep beep beep, beep beep beep, beep beep beep three times to remind the user. When a serious gas failure is detected and a gas fault is selected to switch to fuel, there will be beep beep, beep beep, beep beep ... and keep reminding;