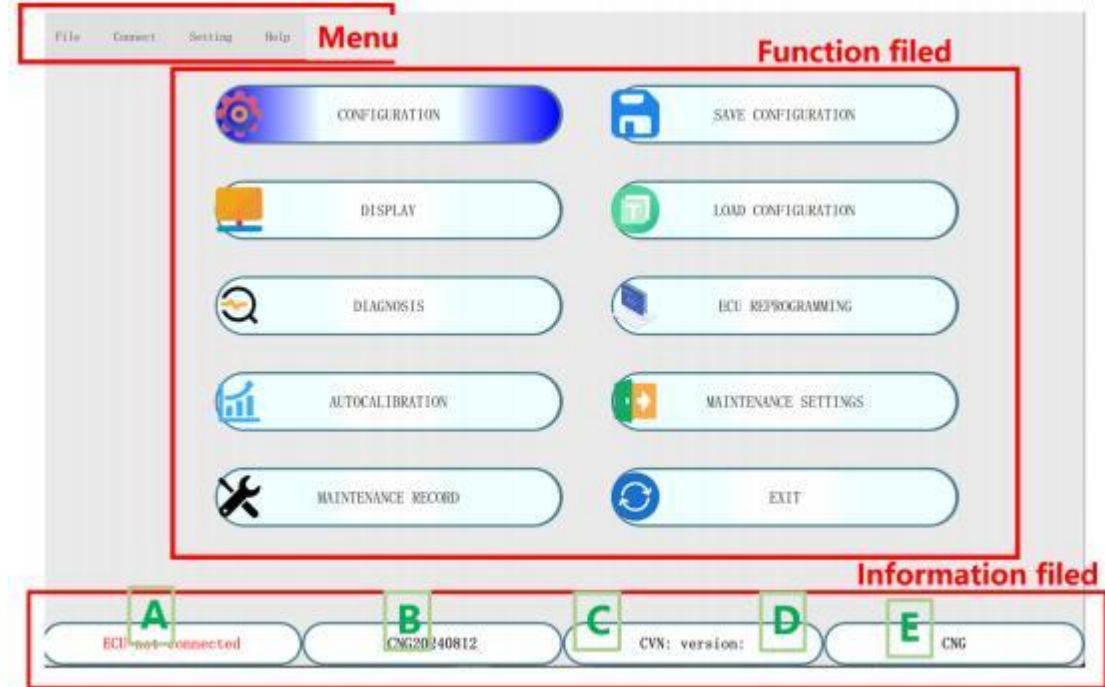


Calibration software manual

1.Introduction



The software mainly includes the following functional modules:

- **CONFIGURATION:** used for the configuration and calibration of key system parameters
- **DISPLAY:** display each monitoring parameter in the form of an oscilloscope
- **DIAGNOSIS:** used for gas system fault diagnosis, fault code and freeze frame reading and clearing
- **AUTOCALIBRATION:** complete the automatic calibration of the gas system through AI according to the self-learning and self-training methods
- **MAINTENANCE RECORD:** used to record the customer's operations during system maintenance
- **SAVE CONFIGURATION:** saves configuration data after calibration parameters for later use.

-
- **LOAD CONFIGURATION:** It is convenient for customers to use existing calibration data without re-calibration and matching
 - **ECU REPROGRAMMING:** used to upgrade the controller software
 - **MAINTENANCE SETTINGS:** convenient for customers to set maintenance related parameters

2. Software installation

2.1 Installation requirement

- **Operating system:** Windows 7 or later versions
- **RAM Memory:** 128MB or more
- **Hard drive:** 512MB or more
- **Display resolution:** 800*600 or more

2.2 Installation method

Double-click the 《setup.exe》 installation file and follow the software tips to complete the installation. During the installation process, you will be asked which directory you want to install in. You are advised to install the software in the default installation path. When the installation is completed, the program icon will appear on the desktop.

The software is divided into offline and online mode. Offline mode: When the ECU is not connected, the software is opened and the offline mode is adopted by default. If the software is required to enter online mode, it must be connected to the ECU via a specific communication line.

3. How the software is used

After the software is installed, double-click the software icon. The software will automatically run and go to the main page. Click each function button on the main page to enter the corresponding control function module.

3.1 Menu

The top menu bar of the software is:

- **File:** You can exit the software and display the display resolution of the computer
- **Connection:** Connect and disconnect the gas ECU from the software
- **Settings:**
 - ✓ **Setting:** You can select the communication port (when opening the software, it will automatically search for the appropriate communication port, or you can manually set a

-
- fixed communication port).;
 - ✓ Language: choose different languages according to customer needs;
 - ✓ Font: depending on the display resolution of different computers, customers can adjust the font size through the settings to make the software display more suitable for their personal needs;
 - ✓ Record: the software can record data in real time..
 - **Help:**
 - ✓ Manuals: includes the software user guide and wiring diagrams;
 - ✓ About: you can view the current software version number and perform online upgrades;
 - ✓ Contact: provides our company's service WeChat and e-mail.

3.2 Information bar

- A. ECU communication: displays the status of connection or disconnection between the gas ECU and the calibration software. If the connection fails, "ECU disconnected" is displayed; if the connection succeeds, "ECU connected successfully" is displayed. When the calibration software is turned on, it automatically attempts to connect to the gas ECU. If the software is not connected, a dialog box is displayed. Check whether the calibration cable is connected and the gas ECU is powered on.
- B. The configuration file name in the current gas ECU is displayed
- C. Display the unique CVN identifier within the gas ECU
- D. Display the software version of the gas ECU
- E. Display the type of fuel used in the current gas ECU profile (CNG or LPG)

3.3 Function bar CONFIGURATION

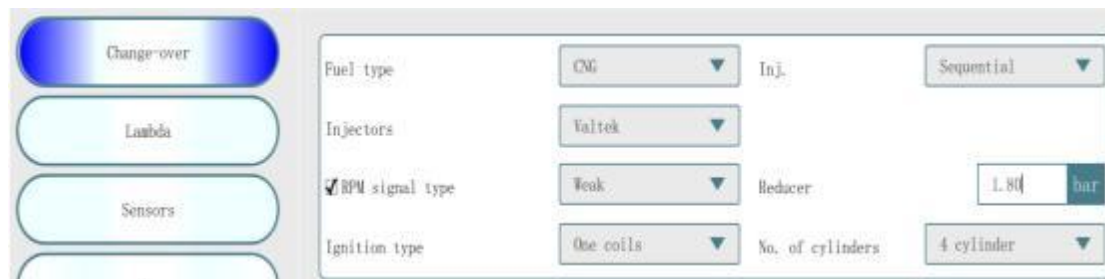
The system parameter configuration page contains 8 sub-function modules and monitoring data area, each function module is used to set gas system related parameters.

The bottom line of the system parameter configuration page is the implementation data area, including:

- **Change over switch:** gasoline mode, wait for transition mode, gas mode, gas level state
- **Revs:** engine speed
- **T.gas:** gas temperature collected by gas temperature sensor
- **T.reduc.:** temperature of the circulating water detected by the temperature sensor mounted on the pressure regulating valve
- **Battery:** gas ECU real-time acquisition of the supply voltage
- **TInj.gas:** gas injection time
- **TInj.petrol:** petrol injection time
- **Open/Closed:** The gas unit detects whether the gasoline controller oxygen closed loop or oxygen open loop status
- **CUT-OFF:** The vehicle is in the condition of oil/gas cut-off
- **Press.Gas:** the pressure difference between the gas in the gas jet rail and the air in the intake manifold
- **MAP:** The air pressure in the intake manifold
- **Oxygen sensor:** Oxygen sensor voltage collected by gas ECU (optional)
- **OBD:** Displays the communication status of the gas ECU and OBD
- **Slow/Fast trim:** long and short term learning values, if the vehicle OBDII signal is connected, the gas ECU can read the long and short term learning values of the gasoline ECU.

3.3.1 Change-over

Change-over page contains the following gas parameter Settings:



- **Fuel type:** set whether the system is CNG or LPG
- **Injectors:** select the Injectors data of the corresponding manufacturer according to the actual Injectors type used by the system
- **RPM signal type:** standard signal (connected to 0~12V square wave signal) and weak signal (connected to 0~5V square wave signal), you can also disable this function by canceling the front side to select the box ✓
- **Inj.:** default "Sequential injection" mode
- **Reducer:** used to set the reducer outlet pressure difference
- **Ignition type:** the engine speed is calculated by selecting the signal source of engine speed. "one ignition" means that each cylinder of the vehicle is only equipped with one ignition coil, and the RPM signal line is connected to the negative terminal of one coil; "two ignition" means that the vehicle is equipped with an ignition coil for every two cylinders, and the RPM signal line is connected to the negative terminal of one of the coils; "RPM sensor" means that the RPM signal line is connected to the tachometer signal line of the gasoline system;
- **No. of cylinders:** select according to the actual number of cylinders of the vehicle



- **Turbo:** Select according to whether the vehicle is equipped with supercharger
- **Valvetronik:** This function allows to enable a particular strategy in cars equipped with this device. These cars, during the CUT-OFF, cut also the ignition signal; consequently the control unit loses the rpm signal with consequent switch back to gasoline. Enabling this feature solves this problem.
- **Start&Stop:** On cars fitted with the device enabling this function when the car is stopped, when you start the engine directly to the GAS. In the case where stop exceed 5 mins, the car part GASOLINE and remains predisposed for subsequent transition to GAS.

- **MultiAir:** This function allows to enable a particular strategy in cars equipped with multiair technology. In these cars, under certain conditions, the accelerator throttle works slightly differently from normal; for example it works on idle and opens at a certain run speed and motor load. This effect does not allow a correct engine mapping as carburetion gaps may happen that jeopardize the smooth driving while working on gas. Enabling the multiair function, the system uses a different compensation for the gas injection pressure. This function can be used also on cars equipped with VALVETRONIC device or on systems with dynamic variation of the engine intake geometry.

Type of change-over	In acceleration ▼
Revs. threshold for change-over	1600 rpm

- **TYPE OF CHANGE OVER:** The mode of switching over from PETROL to GAS can be selected.

In acceleration: PETROL switches over to GAS during acceleration when the vehicle exceeds the number of revolutions set in "REV THRESHOLD FOR SWITCH OVER" .

In deceleration: when the rpm exceeds the reference set in "REV THRESHOLD FOR SWITCH OVER" and then drops below this reference

- **REV THRESHOLD FOR CHANGE OVER:** Identifies the rpm at which you want the petrol- gas switch over to take place

☐ Start on gas with hot engine	70 °C
Reducer temperature for change-over	60 °C
Change-over from petrol-gas delay	5 s
☐ Switching petrol for low gas temperature	0 °C
Num. of inj. between cylinders change over	0

- **Start on gas with hot engine:** Enabling this function the vehicle starts directly on GAS, ignoring the settings chosen for "Reducer temperature for Change over" .When the reducer temperature exceeds the set value, the system will directly start with GAS. It is recommended that the temperature be greater than 60.
- **Reducer temperature for change-over:** It indicates the temperature the reducer has to reach so that switching to gas is allowed. The ECU will not switch to gas below this temperature. It is recommended to set a temperature between 40 °C and 50 °C.
- **Change-over from petrol-gas delay:** It indicates the minimum time from engine ignition for switching over from PETROL to GAS. It is recommended that the delay time be greater than 20 seconds.

- **Switching petrol for low gas temperature:** It sets the gas temperature value that inputs the switch from gas to petrol.
- **Num. of inj. between cylinders change over:** identifies the number of engine revolutions that elapses between the passage of an injector GAS and the next. This function is enabled only if the page "GAS/PETROL" is selected "Sequential fuel changeover" The value defaults to 0 , in this case, the transition occurs in a sequential way using the factory settings.
- **Petrol pump cut off:** When the system needs to control the gasoline pump, and the gas harness is also connected to the gasoline pump, be sure to check this function, otherwise it will cause the petrol and gas switching process to stall.

ECU重设

- **Reset ecu:** All control unit configuration parameters are reset and put back in the original configuration when this button is pressed. We recommend that this button will be pressed if you are unsure, you have correctly set all ECU parameters and you want to start with the original configuration of the parameters.

3.3.2 Lambda



The screenshot shows a software interface for configuring lambda parameters. It contains two main elements: a dropdown menu labeled 'Number of banks' which is currently set to '2', and a yellow rectangular button labeled 'Fuel trim bank 2'.

- **Number of banks:** This selection allows to set the number of banks in which the engine is divided into.
- **Fuel trim bank 2:** When the number of banks is set at two, this item appears. Its purpose is to be able to modify (enrich or weaken) the GAS carburetion concerning the second bank in vehicles equipped with two front lambda probes if the two banks are working slightly off-balance. In particular, in the case of 4-cylinder vehicles, carburetion of the GAS B and C injectors is unbalanced respected to carburetion of the GAS A and D injectors when this parameter is changed.

Type of pre-catalytic oxygen sensor	0 -1 Volt ▼
Oxygen Sensor 1 (purple wire)	Not connected ▼
Oxygen Sensor 2 (purple/black wire)	Not connected ▼

- Type of pre catalytic oxygen sensor:** When this parameter is set correctly, the ECU is able to detect operation of the lambda probe. Before you select the type of Lambda Probe, check its operation with a digital multimeter. With probes having 0-1Volt, 0-5Volt, 5-0Volt, 0.8- 1.6Volt voltage, follow these instructions if you want to read only its value: Connect the PURPLE wire to the lambda probe without interrupting the original connection (therefore leave the GREY wire disconnected). If you want to check the emissions, follow these instructions:
 Interrupt the original connection and connect the PURPLE wire to the sensor and the GREY wire to the PETROL control unit.
- Oxygen Sensor 1:** It allows to check the values of a front lambda sensor and eventually to emulate a rear lambda probe.
- Oxygen Sensor 2:** It allows to check the values of a front lambda sensor and eventually to emulate a rear lambda probe.

3.3.3 Sensors

Level Sensor		Not std ▼	
Reserve	1/4	2/4	3/4
56	115	162	216
Accept		LEVEL	256

- Level Sensor:** It informs the gas ECU what type of level sensor was used
 - ◆ AEB: set AEB if a sensor with an AEB standard output signal sensor is connected. Refer to the assembly drawing of the gas ECU for connection.
 - ◆ 0-90ohm: set 0-90 ohm if a sensor with output signal sensor ranging between 0 and 90 ohms (e.g. AEB1090) is connected. Refer to the assembly drawing of the gas ECU for

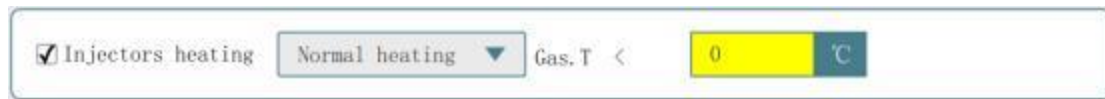
connection.

- ◆ Not std: set this option if an LPG or CNG resistive sensor with a variable STRAIGHT signal (lower Ohm value with higher vacuum level and value Ohm with full level) is connected.
- ◆ Not std inverted: set this option if an LPG or CNG resistive sensor with a variable REVERSED signal (higher (Ohm) value with lower vacuum level and value (Ohm) with full level) is connected.

Attention: the reference levels reserve -1/4 -2/4 -3/4 are only displayed if the sensor selected is NOT std and NOT std inverted. This option appears only if NOT std or NOT std inverted is set in the "LEVEL SENSOR" box.

Set the reference values necessary for setting the level sensor as follows:

- manually move the sensor indicator starting from the full level and note the value indicated in "Level" for each reference (RESERVE, 1/4, 2/4, 3/4).
- enter the values noted in the corresponding boxes.
- press the **ACCEPT** button.



- **Gas leakage detector:** The system supports a maximum of two gas leak detectors. For the specific models supported, please contact our company's service personnel.



- **Injectors heating:** After this function is enabled, the system will heat the gas injectors before the gas temperature exceeds the set temperature. This function is suitable for cold regions and can solve the problem of stalling after switching during low temperatures.
- **Heating mode:** It can be divided into Normal heating and Fast heating. The default is Normal heating mode.
- **Gas.T:** The gas ECU will heat the gas injectors when the gas temperature is below the set temperature. Higher than the set temperature, automatic stop heating function.



- **Pressure sensor:** It informs the GAS ECU what type of MAP sensor is being used (AEB 025 – AEB 013)

- **NTC temp gas:** allows you to set the value of the NTC used on the temperature of the gas.
- **NTC temp engine:** allows you to set the value of the NTC used on the engine temperature.

☐ Tank solenoid valve with dedicated wire

☒ Gas electrovalves opened in advance

☒ Automatic change back to petrol

Low pressure time for change back

0
 S

Low pressure value for change back

1.14
 bar

- **Tank solenoid valve with dedicated wire:** Enables diagnosis of the GAS solenoid valve of the tank. If there is no sheath with BLUE- WHITE and BLACK wires on the GAS ECU cable (wires expressly dedicated to powering the rear multivalve) or they are not connected, do not enable this control; otherwise, the GAS ECU might save errors.
- **Gas electro valves opened in advance:** the Gas ECU usually enables the gas solenoid valves about 1 second before switching from PETROL to GAS in order to allow the pipes filling. If the time span is not enough to prevent the vehicle from shutting down while switching from one fuel to the other, it is possible to enable this function so that the gas solenoid valves are opened (and stay open until the switch- over is completed) at least 5 seconds before switching over to gas allowing a major filling of the pipes.
 ATTENTION: If this function is enabled, a warning message reminds you to not interrupt the PETROL pump because it would cause the vehicle to shut down.
 ATTENTION: If you use a timing advance processor, it is not recommended to enable this feature.
- **Automatic change back to petrol:** The switch-over from GAS (whether it is LPG or CNG) to PETROL is automatic when the pressure drops below the minimum operating pressure.
 Note. It is recommended to keep the function enabled to prevent system malfunctions.
- **Low pressure time for change back:** It indicates the delay in going back to PETROL in the case of operation at minimum operating pressure.
 Note. It is recommended to leave the parameter at ZERO, which is the default value.
- **Low pressure value for change back:** Indicates the minimum value pressure reached GAS to which is carried out back pass petrol.

3.3.4 MAP

(1) Gas Multiplier:

This menu shows a numerical display of the multiplication coefficients called K the ECU uses in calculating the GAS injection time.

The table displays the petrol injection times on the Y axis, the engine rpm on the X axis. The red dot displayed on the map the rpm references and petrol injection time in which the engine is running.

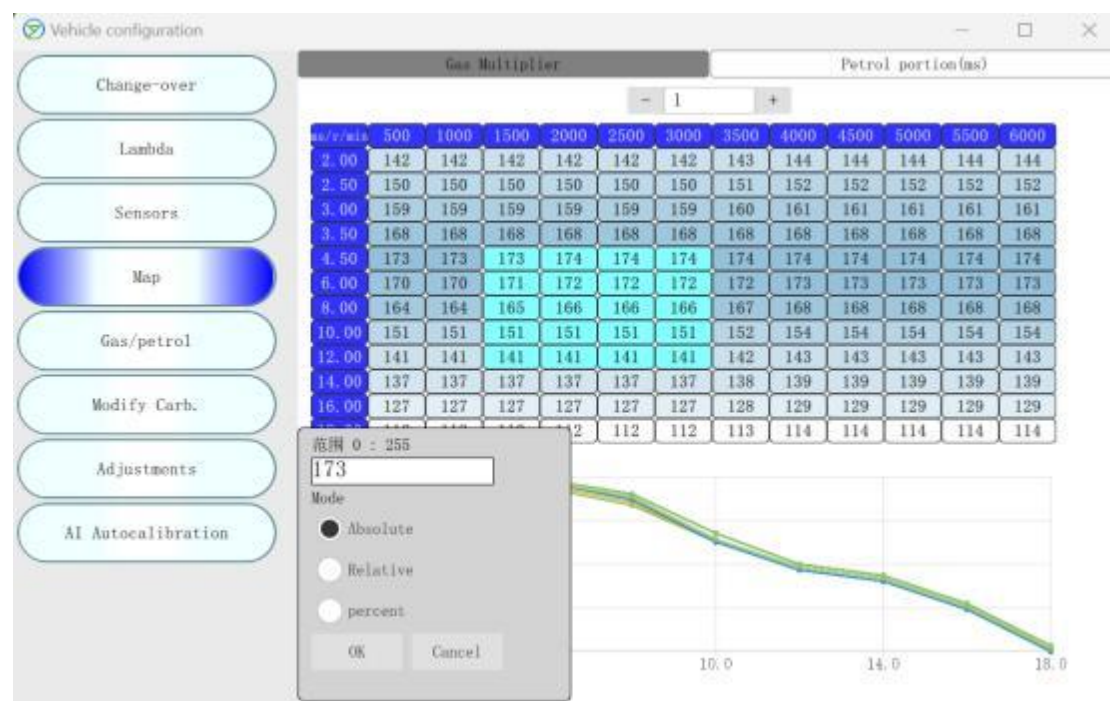
To change the K values, select one or more map boxes and press enter; a window with the following modification modes will appear:

Absolute - the value corresponding to the one entered can be exactly placed in the map.

Relative - adds or subtracts the entered value to or from the one already in the box or boxes selected.

Percentage - adds or subtracts the entered value to or from the one in the box or boxes selected in percentage.

The references regarding the engine revolutions and the PETROL injection time can be modified.



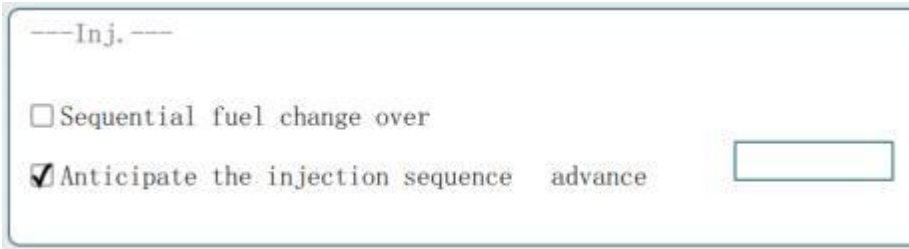
(2) Petrol portion:

This function displays the required fuel blending amount in the form of a chart. The MAP table is mainly designed to enhance the insufficient power of some vehicles at certain operating conditions. By blending fuel, the vehicle's power performance can be enhanced. The Y-axis of the table shows the gasoline injection

time, while the X-axis shows the engine speed. The red dots on the MAP indicate the position of the engine speed and petrol injection time, which are used to locate the current operating condition of the vehicle. After activating the fuel blending time MAP function, users can quickly view the overall fuel blending situation. The darker the color, the greater the fuel blending amount.

To modify the fuel blending value, select one or more data cells and press the Enter key. A window for editing the data will appear. This window allows you to modify the data in absolute value mode, relative value mode, or percentage mode. The same functions apply to the data on the coordinate axes.

3.3.5 Gas/petrol



- **Sequential fuel change over:** GAS is switched over to gradually one cylinder at a time when this function is enabled (recommended default option). The switch over is usually smoother when this function is used. If this function is not enabled, the PETROL injectors are all disconnected at the same time and switching over to GAS is immediate..
- **Anticipate the injection sequence:** this is a guided procedure which allows automatic acquisition of the original injection sequence and enables a phase shift in advance of the gas injection. The entity of the phase shift also depends on the “advance” control. This advance can improve vehicle function especially if the gas injectors are distant from the intake manifold. This function is to be used only if it is really necessary since it disables the gradual PETROL-GAS switch over feature, with the switch over occurring instantaneously..
- **advance:** the advance of the gas injection time relative to the gasoline injection cylinder, for example, when set to 1, the gas injection time is equivalent to the injection of a cylinder in advance of the petrol injection.



Operation at idle:

- **Gas:** the vehicle always works on GAS in case of low speed when this function is enabled (recommended default option) ..
- **Return to petrol:** while returning to idle speed, for a few seconds the vehicle switches to petrol and then returns to gas, in some cases preventing the vehicle from switching off during this phase. Only use this function if absolutely necessary. The value “Operation at idle” determines the number of revolutions below which this strategy is enabled.
- **Petrol:** when running at idle speed, lower than the value of the set “Operation at idle” revolutions, the vehicle always runs on petrol. Gas function is restored when the number of revolutions exceeds the set “Operation at idle” value. This function can only be used if running on gas at idle speed is practically impossible, unstable and causes the vehicle to switch off frequently. The system is running on petrol it is not indicated on the switch (which stays on gas) , but by reading the gas injection time on the computer. In this phase, the switch continues display gas function and the gas solenoid valves stay enabled.

—Operation at high RPM with petrol partialization—

☐ Gas
 ☒ Petrol addition
 ☐ Petrol
 ☐

RPM for petrol addition from rpm to rpm

Petrol inj. time for petrol addition ms

Amount of petrol addition ms

Operation at high RPM with petrol partialization:

- **Gas:** the vehicle normally runs on GAS when this function is enabled, even at high engine speed and load (recommended default option).
- **Petrol addition:** by enabling this function, there is the possibility to deliver an additional contribution of PETROL to the normal GAS injection. You can therefore set:
 - RPM window inside of which PETROL contribution goes into effect.
 - The PETROL contribution injection time, i. e. the read PETROL injection time reference, over which the PETROL contribution is delivered.
- **Petrol:** temporary high engine speed and load operation with PETROL will begin when this function is enabled, and will last until the accelerator is released. Both the number of revolutions and the injection time after which the GAS ECU will switch over to PETROL can be set.

This function will be particularly recommended for all vehicles equipped with a very delicate catalyst subject to overheating while running on GAS.

Another application where this system proves to be extremely useful regards highly powerful engines (usually turbo), where in order to be able to power the high-load engine we are forced to use large GAS injectors with consequent instability at low loads. The fact that the system is running on petrol is not indicated on the switch (which stays on gas), but by reading the gas injection time on the computer. In this phase, the switch continues to signal gas function and the gas solenoid valves stay enabled. If there is an advance variable valve timing mechanism, if the supply remains active during this phase, ensure the idle speed advance does not disturb the system.

---Over-rich mixture---

☒ Enable ☐

Revs condition 4250 rpm

lambda over-rich protection 0.910

- **Over rich mixture:** The function is only available for controllers with OBD. In the case of normal communication between the gasoline OBD diagnostic and the gas ECU, if the function "Enable" is allowed, the speed is greater than the set value of "Revs condition", and the air-fuel ratio is less than "lambda over-rich protection", the gas ECU will enter the protection strategy of the air-fuel ratio is too thick to prevent the burning of the catalyst and the engine intake and exhaust valve.

☐ Cut-off petrol switch-back transition 0

- **Cut-off petrol switch-back transition :** After the function is enabled, the injection is resumed in the petrol cut-off condition, and the first few working cycles use gasoline to ensure that the engine speed does not drop abruptly or stall. The specific number of times of gasoline injection is determined by the injection number setting.
- **3.3.6 Modify carburetion**

OBD connection type CAN-STD-500 ▼

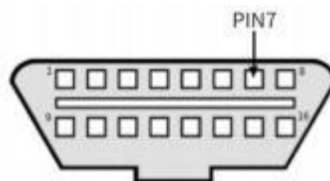
☒ Adaptivity

Type of PETROL trimmers ☒ Standard ☐ Inverted

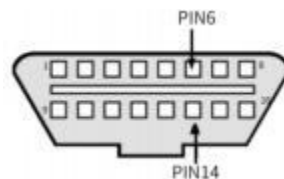
☐ Clear Petrol ECU DTCode

- **OBD connection type:** The system supports two kinds of gasoline OBD communication, K line communication and CAN bus communication. The default system setting selects "auto" automatic matching mode, and the software automatically tries to connect to the vehicle and tests all available OBDII connection types until a suitable connection is found.

- ◆ K line communication: The gas harness needs to be connected to port 7 of the gasoline OBD plug. The gas ECU supports three modes of ISO 9141-2, KWP-2000 fast initialization and KWP-2000 slow initialization.;

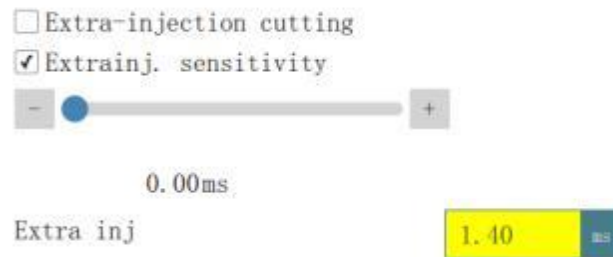


- ◆ CAN communication: gas wiring harps need to be connected to gasoline OBD plug No.6 and 14, gas ECU supports CAN-STD-250K, CAN-EXT-250K, CAN-STD-500K, CAN-EXT-500 baud rate 250k and 500k, standard frame and extended frame OBD protocol;

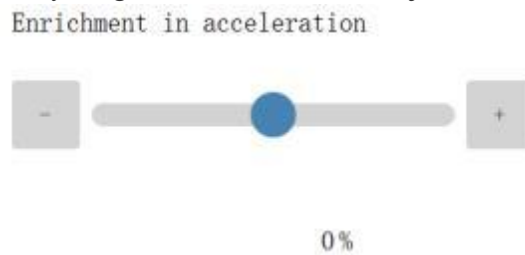


- **adaptivity:** This function allows the OBDII connection in those vehicles equipped with electronic control system. It makes it possible to adapt the GAS calibration according to the behavior on petrol only in closed loop conditions.
- **Type of PETROL trimmers:**
 Standard: choose this petrol trimmer if the vehicle carburetion tends to weaken increase of calibration values.
 Inverted: choose this petrol trimmer if the vehicle carburetion tends to weaken at the negative increase of calibration values.
- **Clear Petrol ECU DTCode:** If you enable this feature allows you to completely

erase the list of diagnostic errors detected.



- **Extra-injection cutting:** If this function is not selected, all injection will be recognized by the gas ECU as normal injection, and the gas system will be normally controlled; Select this function, gasoline injection less than the "Extrainj. sensitivity" will be filtered out by the gas ECU;
- **Extrainj. sensitivity:** If this function is enabled, the recognized multiple injection of gasoline is normally recognized by the gas ECU and the "Extra inj" value is added.



- **Enrichment in acceleration:** In some models of vehicles, the PETROL injection time almost instantaneously changes from a low value to a high value (e.g. 12-16ms) when accelerating suddenly. This can cause malfunctioning when GAS is used since the carburetion would be greatly enriched. To get round this problem, use the "Enrichment in acceleration" slider in the following way:
 - By moving towards the plus sign, the ECU will follow the PETROL injection time changes faster and faster.
 - By moving towards the minus sign, this change will be increasingly narrower and narrower.



- **Injector minimum opening time:** this value is used to set the minimum injection value of the gas injection.
- **3.3.7 Adjustments**

Reducer temperature correction

20	25	30	35	40	50	60	70	80	℃
-12	-10	-8	-6	-4	-3	-2	-1	0	±100%

Gas temperature corrections

0	10	20	30	40	50	60	70	80	℃
-12	-9	-6	-3	0	2	4	6	8	±100%

- In this menu you can set percentage corrections on the GAS injection time obtained according to the reducer and gas temperature.

Note: The default parameters have been tested by our personnel. It is not recommended to change them.

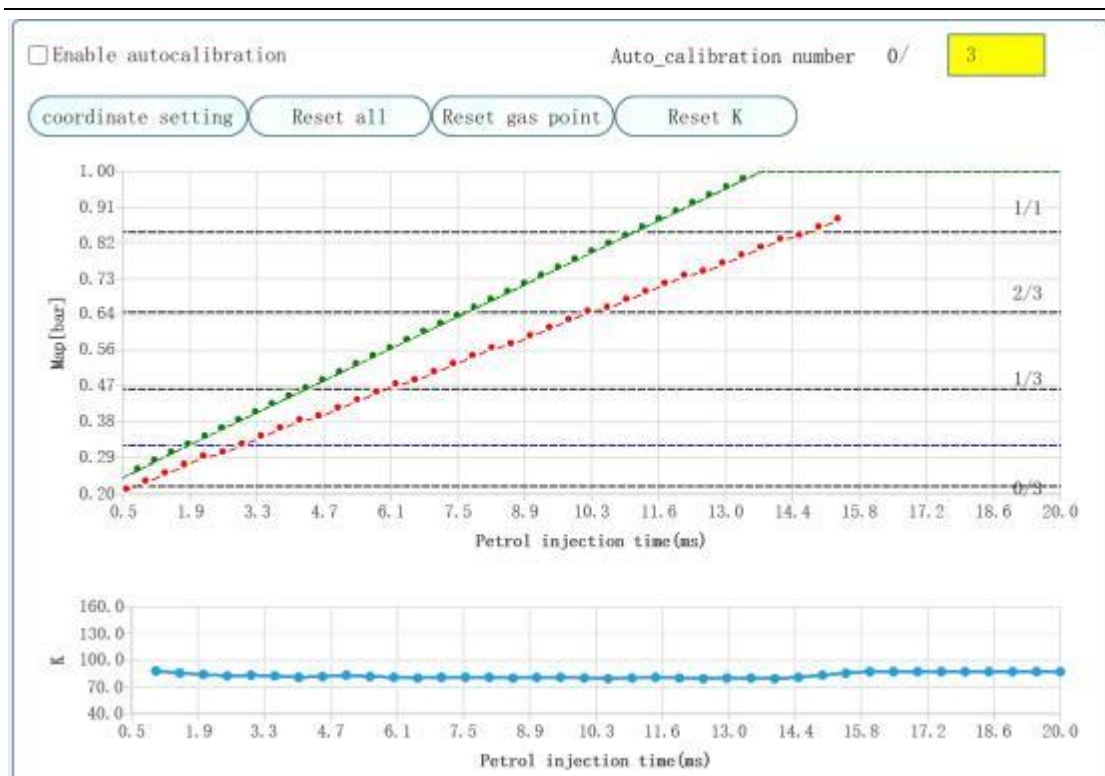
• 3.3.8 Autocalibration

If you want to fine-tune your vehicle's driving performance, follow these steps:

- 1) First, keep the switch in the gasoline state;
- 2) Check the "Enable autocalibration" button, the system will start to record parameters when the conditions are met. There are four regions, and the gas ECU must obtain a sufficient number of parameters to properly calibrate the system;
- 3) Drive the vehicle so that the gas ECU can collect the required data (when the gasoline completes the data collection, all the collected data will be simulated into a red curve; When the gas data collection is completed, all the collected data will be simulated into a green curve);
- 4) Turn the change-over switch to the gas state
- 5) Repeat Step 3.

In this function module, buttons function as follows:

- ◆ Coordinate setting: Click this button to modify the range of each coordinate in the diagram;
- ◆ Reset all data: Click this button to clear all sampling points, sampling curves and calibration data;
- ◆ Reset gas point: Click this button to clear the sampling point and line data of gas status;
- ◆ Reset K: Click this button to clear correction factor K



3.4 Function bar-_DISPLAY

This function module displays gas monitoring data graphically by oscilloscope.



- Coordinate Settings: This feature allows you to set the maximum and minimum values for four Y-axes.

- Stop/Start: By clicking this button, you can pause and resume the oscilloscope function.

3.5 Function bar-DIAGNOSIS

This function module can diagnose the relevant faults of the gas system, and record the relevant fault code and freeze frame (when a fault occurs, record some important parameter data of the gas system) data.

The top screenshot shows the 'Diagnosis' button selected, displaying a list of faults: Power supply voltage fault, Calibration data verification fault, and Frequent Storage Data Verification fault.

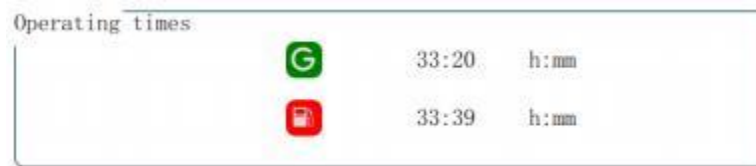
The bottom screenshot shows the 'Freeze frames' button selected, displaying a detailed freeze frame for a Gas pressure sensor fault, including parameters like Closed-loop operation, Changeover switch, P/G state, CUTOFF, RPM, and injector timing.

- ◆ **Diagnosis:** Click this button to read the gas fault code of the gas system
- ◆ **Freeze frames:** Click this button to read the freeze frame data of the gas system
- ◆ **Save freeze frame:** Click this button to save the freeze frame data

The top screenshot shows 'Petrol injectors' with a table for 4 cylinders, each with OK and X status buttons and a T. Inj. value of 5.

The bottom screenshot shows 'Gas injectors' with a similar table for 4 cylinders, each with ON and OFF status buttons and a T. Inj. value of 5.

- ◆ **Petrol T.inj:** This page displays the petrol injection time for each cylinder;
- ◆ **Petrol injectors diagnosis:** under normal circumstances, the petrol injector of each cylinder is OK and normal. If the petrol injector is faulty or disconnected, the state of X red will be displayed;
- ◆ **GAS T.inj:** This page displays the gas injection time for each cylinder;
- ◆ **GAS injectors diagnosis:** under normal circumstances, the gas injector of each cylinder is OK and normal. If the gas injector is faulty or disconnected, the state of X red will be displayed;



- **Operating times:** The gas accumulation run time and petrol accumulation run time of the system are displayed respectively;



Enable diagnosis

Reset errors

- **Enable diagnosis:** If this function is selected, the gas system diagnosis function is enabled. If not selected, fault diagnosis is not performed.
- **Reset errors:** Click this button to clear the gas system's fault code and freeze the frame data.

3.6 Function bar-AUTOCALIBRATION

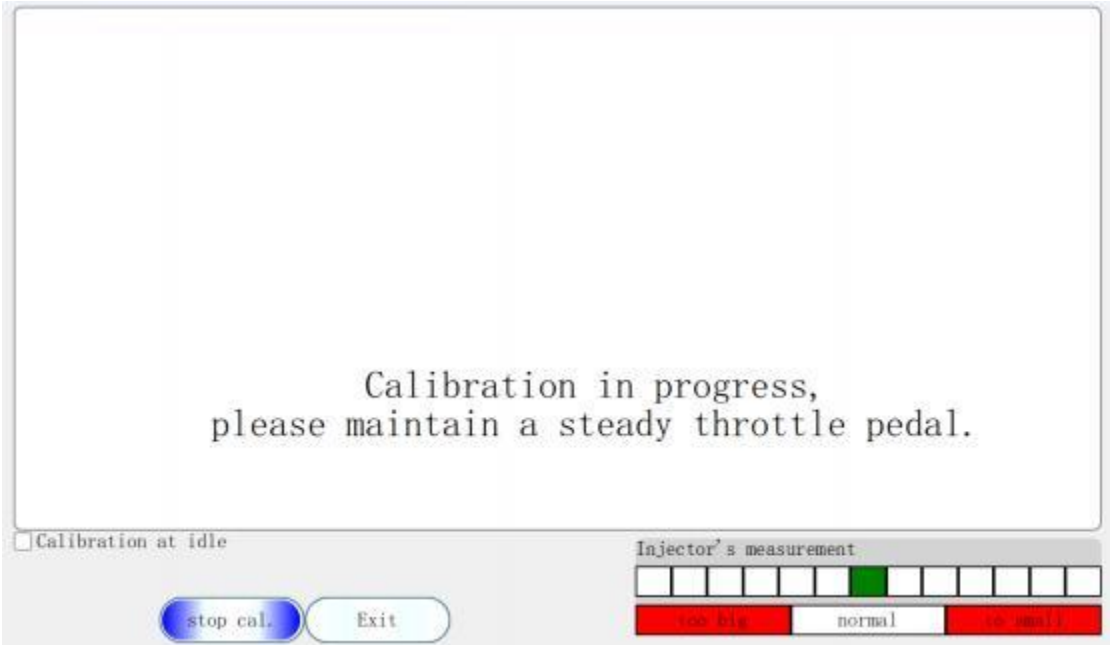
The AUTOCALIBRATION function module automatically calibrates the gas ECU to obtain the correct gas injection time during gas mode operation. Before starting automatic calibration, it is important to check that the gasoline running condition of the vehicle is good, because the gas injection strategy is based on the gasoline injection strategy.

Automatic gas calibration is performed according to the following steps:

- 1) Let the vehicle run in petrol mode, and check whether the following parameters are correct: gasoline injection time, engine speed, gas temperature, pressure reducing valve temperature
- 2) Wait for the engine to reach the change-over temperature
- 3) Choose whether to complete automatic calibration at idle speed
- 4) Press the "Start calibration" button to start the automatic calibration, and follow the instructions displayed in the calibration software.

Once the engine speed reaches the change-over RPM, the gas ECU will perform several switches from petrol to gas. It is important in this case that the throttle remains stable even if the RPM

changes, without trying to restore the RPM to the value set during gasoline operation. After the automatic calibration is completed, try to run the vehicle on gas to verify whether it can operate normally. If necessary, open the previous MAP page to modify the K value.



• **3.7 Function bar-MAINTENANCE RECORD**

It is used to record the communication time between the calibration software and the gas ECU, the time to modify the setting parameters, and the time to diagnose the fault.

event	date	time	code
First-time ECU connection	2024-03-28	10:00	000
First-time parameter modification	2024-03-29	11:30	000
Last connected to ECU	2024-03-30	14:45	000
Last parameter modification	2024-03-31	09:15	000
Last diagnostic fault detected	2024-04-01	16:20	000

• **3.8 Function bar-SAVE CONFIGURATION**

All calibration parameters in the calibration software can be saved in the default path of the file, the file name can be defined according to customer requirements. This configuration file can later be applied to other gas ECU in vehicles of the same model and fuel type (CNG or LPG). specify the name of the file you want to save, and then click OK.



- **3.9 Function bar-LOAD CONFIGURATION**

A pre-existing configuration file can be loaded into the gas ECU under the software default path.
Select the configuration file to be loaded and click the OK button.



- **3.10 Function bar-ECU REPROGRAMMING**



The software supports gas ECU program update and upgrade functions. When the gas ECU is powered on, click the program file to be updated, and then click the download button to realize the software upgrade and update task of the gas ECU.

- **3.11 Function bar-MAINTENANCE SETTINGS**

System Information

Total mileage	0 Km	GAS mileage	0 Km
Maintenance mileage	0 Km	Displacement	0 ml
Reducer SN:		Injector size	0 mm
Injector SN			
Comments			

- **System information:** Customers can set the relevant information of the vehicle and gas system in this function module as the basis for later maintenance;

Service Information

System times	0 h	
Expected mileage	Km	1h= 0 Km
☐ GAS lock		

- **Gas lock:** In order to enable customers to regularly come to the service station to maintain the gas system and vehicle, the system has a gas lock function, if the customer does not unlock the service station after the lock time expires, the vehicle will not be able to use gas normally.