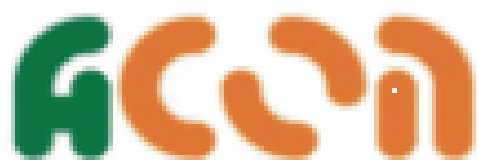


Software documentation for the AGIS OBD CAN gas injection controller starts from ver. 2.7..





Introduction

We are pleased to present our new product – AGIS i8 OBD CAN sequential gas injection controller.

It has been generally designed for application in cars with modern OBD2 systems for fuel delivery diagnosis; however it may be also installed in older car models.

Due to its modern construction and efficient processor, it gives the possibility to meet strict standards concerning exhaust fumes emission while maintaining the drive dynamics similar to that when petrol is used.

AGIS OBD/CAN is a new concept and unique in the market sequential gas injection controller with communication mode through digital controller area network CAN. The new AGIS controller has therefore a possibility of petrol computer ABD ECU diagnostics from the LPG controller software level. The advantage of this controller is the ability of an ideal LPG calibration for petrol, continuous OBD setting monitoring and its automatic correction to the level specified by EURO exhaust fumes emission standards.

New controller abilities:

- 1) Can be connected to the controller area network CAN (in cars manufactured after the year 2003.)
- 2) Single emulator with a function for testing LPG injectors
- 3) Lambda probe emulator
- 4) Fast signal processor 120MHz.
- 5) Automatic detection of petrol injection type and its optional configuration
- 6) Compatible with various resistance temperature sensors.
- 7) Connection and read out for two lambda probes
- 8) Maximum revolution function for LPG
- 9) Continuous buzzer signal function
- 10) Possible setting of cut off exit for petrol
- 11) Enlarged scale of entering the corrections on the correction map up to +/- 50%
- 12) Correction charts separate for two parts of V motors
- 13) Two scales for correction map for work of petrol injectors up to 10/20ms

New software abilities:

1. Reading apparatus of the OBD system performing on the CAN, with the function of checking basic diagnostic data, settings and loading in and deleting OBD errors.
2. Advanced digital filtration of all input signals.
3. Ability for data collection for mapping during driving without PC requirement.
4. Automatic detection of petrol injectors controlling type (sequence / semi sequence / non sequence)
5. Three types of controller calibration
6. New algorithms of calibration (separate calibration for each cylinder)
7. New algorithms for LPG injectors warm-up
8. New algorithms protecting from engine stalling at CUT-OFF exit for cars with supercharging.
9. New algorithms allowing servicing vehicles with a problem of permanent petrol injection at high engine speed.
10. Intuitive graphic interface, indicating interchangeably the state of each emulator and LPG injectors for various control types.
11. Tools enabling testing during performance of each emulator and LPG injector, separately for each cylinder.
12. Adjustable cut off parameters on petrol transferred to LPG (full and not full cut off)

FIRST STEPS

ACTIONS SHOULD BE MADE DURING THE FIRST SYSTEM CALIBRATION

During the installation of AGIS OBD/CAN sequential gas injection system it is suggested for the wire set to point downwards. It is also suggested that it should be placed in such a way to avoid the negative impact of high temperature and humidity please check all the connections are proper and correct.

* **check and drill nozzles for correct size** , initial selection of nozzle size is in Settings window, pay attention that initial nozzle size selection is made for working LPG pressure for about 100kPa. in any case, higher pressure set on the reducer determined smaller nozzle size some type of LPG injectors like VALTEK, RAIL and similar, before installing in car, require plunger settings with special rail calibrator. Standard plunger way should be set for about 0,55 mm. Calibration is needed for checking the piston stroke which must be equal for all of the cylinders. For shorter times of injection below 2,5 ms it is recommended to use faster injectors.

* **start application** AGIS_OBD/CAN

* **check correctness of all readings** : RPM signal, working pressure, temperatures and etc. When needed make a changes.

We recommend to set working pressure between 100- 115 kPa, for small engines even below 100 kPa

* After setting basic parameters you can start autocalibration on idle

There are three types of autocalibration on idle:

* **autocalibration**: in one time all the cylinders are switch of and on, this autocalibration is available for all the petrol injection system (full group, semi seq., full seq.)

* **autocalibration per cylinder**: each cylinder is switch of and on separately , calibration is more proper and accurate. This type of autocalibration is available only for full seq. petrol injection

* **fast autocalibration**: is just for quick checking if we are not sure that nozzle size and pressure is chosen correct. After this very fast calibration system will inform us in communication window about level of main correction with some possible recommendations.

In time when calibration goes, system shows, communicates and recommendations after finishing calibration on idle we recommend to create map during the driving. Procedure how to make it you can find below in text.

* **creating map** should be start from driving on petrol, so long so all the points for petrol will be collected. Then switch to lpg and repeat process driving on LPG. When it's also finished, then press STOP button and CALCULATE CORRECTIONS button, then system automatically jumps to CORRECTIONS window proposing ready corrections.

When the diagrams, goes fluently as close as better to zero then we can write to device. In this moment map is done and written to device.

When possible small corrections are needed, there is possible to make it manually. Procedures, how, to make it, is in text below.

For creating map we recommend to use rather low traveling speed than top speed but using whole range of vaccum.

Sharp teeth on corrections diagram says that point collected, during driving are not correct and we recommend to, make it again.

In cars with CAN BUS line we recommend to switch on automatic corrections from OBD trims. In V type engines separately for both part of engines. For more details see chapter OBD.

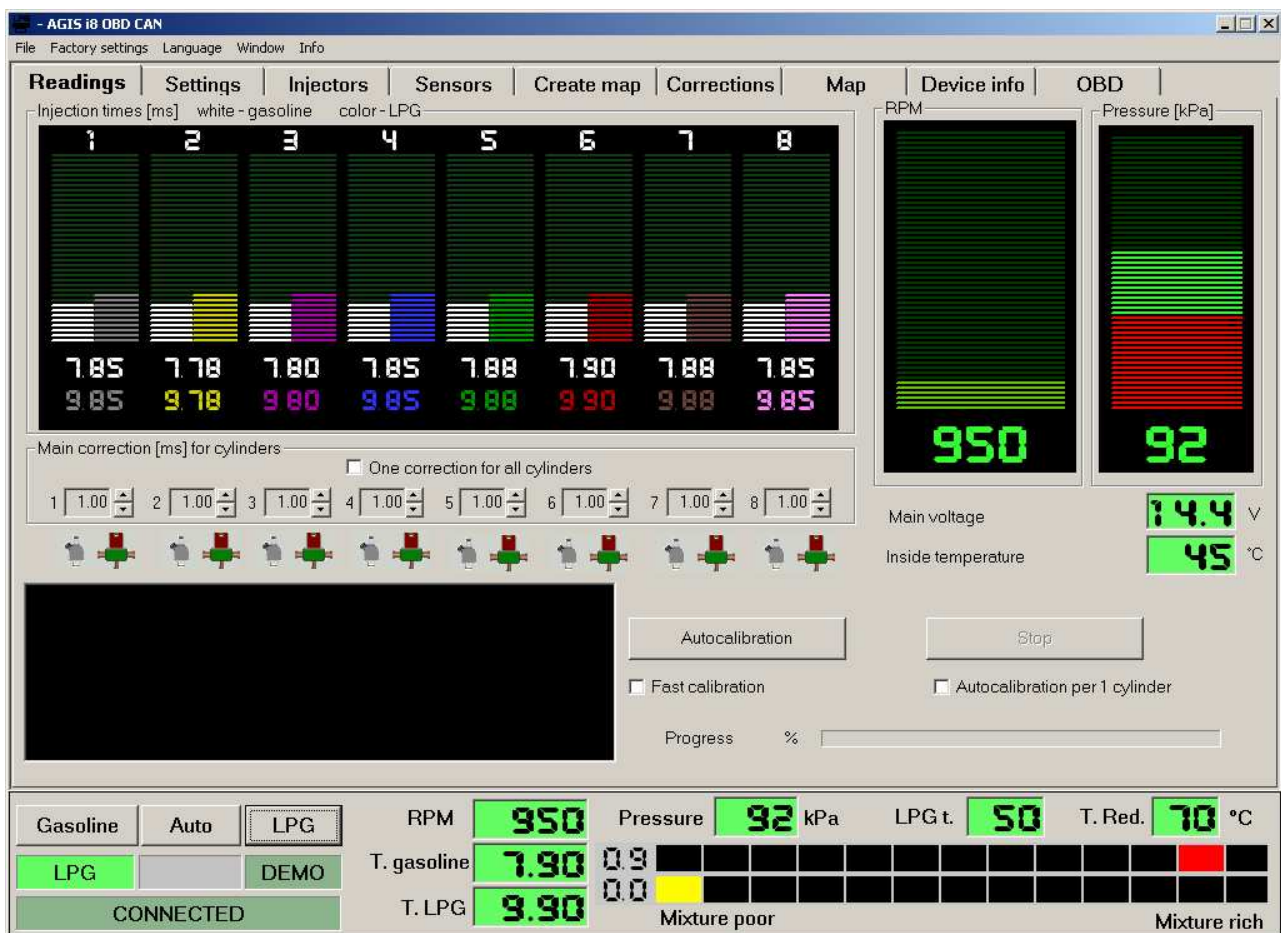
Readouts

After starting, the software shows the motor work parameters in real time, registered by the LPG in figures as well as in the form of bar graphs

These are the following parameters:

- motor revolutions,
- injection times for all injectors (petrol – white, gas – colour,
- temperature of the heater,
- temperature of the gas stream,
- temperature inside the controller casing,
- pressure,
- signal of one or two joined Lambda probes,
- feed voltage.

In the left bottom corner there are keys for switching the controller into petrol, gas and setting for AUTO mode, meaning automatic switching into gas upon fulfilling relevant conditions (temperature and revolutions).



At the bottom, the application shows the state of connection with the LPG controller (connected/disconnected), and errors indicated by the controller.

There are also controller auto calibration keys and indicators. Under injection time display there are signalling devices/diverters for emulators and gas injectors performance, allowing switching

selected cylinders for petrol during LPG performance or switching gas injectors off, which may be helpful for diagnostics.
According to diagnostic functions as above we recommend even for full group and semi seq. to cut all the signals wires with separate emulator



NOTE:

Before installing injector rails type VALTEK, RAIL or similar type, a pre-calibration should be made for checking piston movement.
Piston movement on the rail should be the same for each cylinder. For shorter petrol injection times (2-2,6 ms), it is recommended to set smaller movements , between 0,40-0,45 mm, for petrol longer injection times (3,0-4,0ms), 0,45-0,65 mm.
The initial nozzle sizes selection check in INJECTORS window: INJECTOR SIZE CALCULATOR

Controller configuration – step-by-step.

The first action upon the controller installation is the configuration of the basic parameters which are shown on the tab 'Settings'.

FileFactory settingsLanguageWindowInfo

SettingsInjectorsReadingsSensorsCreate mapCorrectionsMapOBDDevice infoOscil

Fuel typeLPG

Switching parameters

Switch to LPG when RPM rises above1200Switch to LPG when reducer temp rises above35 CLPG switch delay (engine cold)30 sMinimal injection time on switching0 msSwitching to petrol when pressure lower than48 kPaCascade emulator turn on delay1 sSwitch to LPG enrichment☒ 0 % time20 s

RPM signal

RPM signal source1 coil per cylinderRPM signal divider1

Max RPM on LPG☒ Switching8000Return7000Minimal RPM on LPG☒ 500Switch to AUTO when LPG temp. below 3 C degree☐

Read from deviceWrite to device

Pressure corrections

Pressure reference95 kPaGain1Pressure average0.8 sPressure sensorPS 4250DP STD

LPG temperature corrections

Reference0 CGain0.3 % / CLower temperature0 °CUpper temperature60 C

Pressure reading delay☐Buzzer signal continuous☐LPG injectors over-current control☒Faster LPG switching (engine hot)☐LPG valve turn on instantly before switch over☒

Device protections

Minimal supply voltage10 VMax. inside temperature100 C

PetrolAutoLPG

RPM954Pressure89 kPaTemp.LPG50Temp.Red70 C

PetrolDEMO

T. petrol4.08T. LPG6.08

CONNECTED

Mixture leanMixture rich

This is the place to set the parameters for automatic switching into gas, the source of ignition signal (single coil, double coil, rev-counter etc.)

7

At this step, also the minimum pressure for the controller to recognize empty LPG tank is to be chosen. The pressure should not be lower than 60% of the reference pressure (the pressure maintained by the reducing valve during work with gas on low revolutions). Optionally the function of switching into gas for each cylinder could be set - option 'Cascade emulator turn on delay'.

Other options in this window:

- **Switch to LPG enrichment:** this option improves switchover at first time especially at cold engine, works only once at first switch. It gives special additional correction which works during specified short time.
- **Pressure reading delay:** this option causes pressure reading delay just after switch over. Reducer pressure at switch over when condition is not stable
- **LPG injectors over current control:** there is just a protection of LPG injectors, switched on as a factory settings
- **LPG valve turn on instantly before switch over:** this option cause turning on LPG valves when reducer meets switching temperature. Without this function on, LPG valves are activated after 5 sec of start-up, so that to avoid reducer destroying in cold days we recommend to use this function.
- **Faster LPG switching (engine hot):** when the engine is hot , cars starts at once on LPG, without any delay.

Corrections for the variation pressure.

Reference – the gas pressure on the injector rail during work with gas on low revolutions. Default set to 100kPa is the way for the reducer to be regulated.

Gain – describes the mixture enrichment while the pressure on the rail decreases.

Examples:

reference – 100kPa, gain – 1 -> at the pressure decrease to 90kPa, the gas injection duration will be extended by 10%

reference – 100kPa, gain – 0.2 -> at the pressure decrease to 90kPa, the gas injection duration will be extended by 2%

reference – 100kPa, gain – 1 -> at the pressure decrease to 95kPa, the gas injection duration will be extended by 5%

reference – 100kPa, gain – 0.2 -> at the pressure decrease to 95kPa, the gas injection duration will be extended by 1%

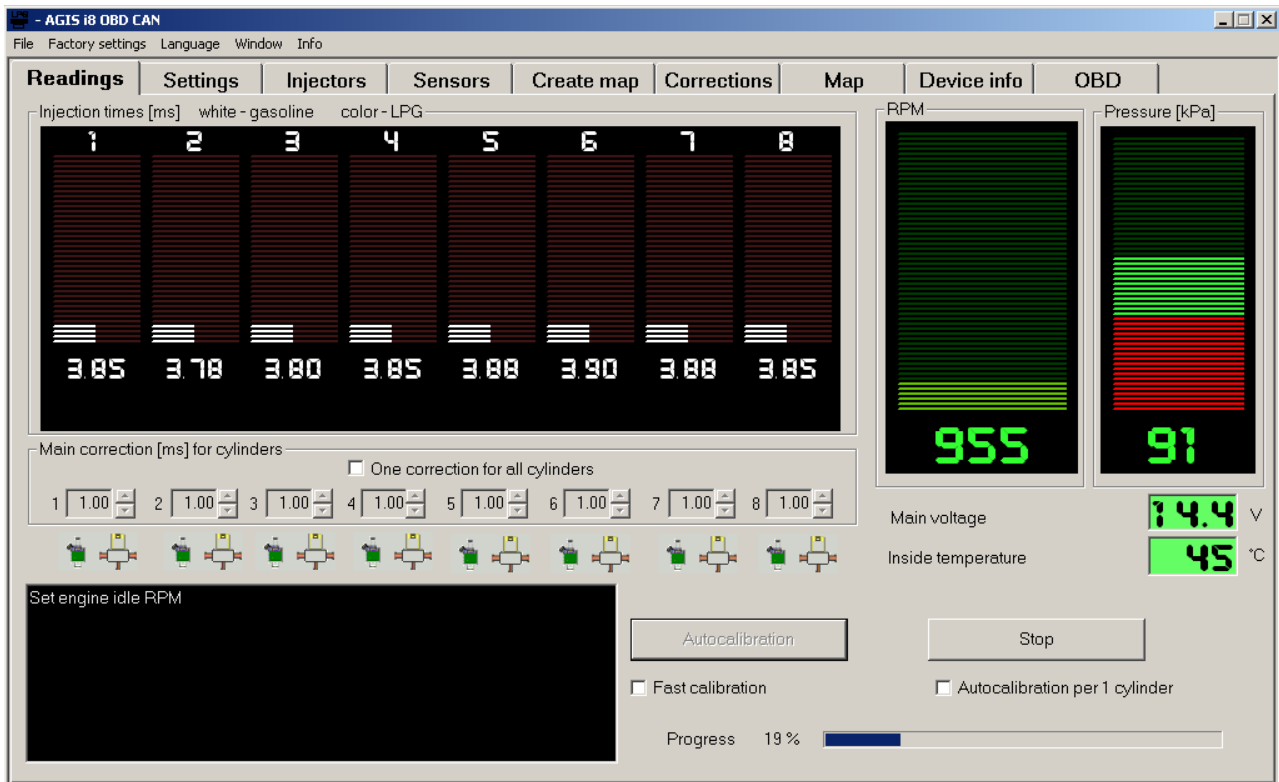
In a situation when the LPG injectors are chosen correctly, the gain is equal to 1. During auto calibration, the pressure reference is set to the pressure value of reducer at minimum load.

Auto calibration

Upon setting the basic controller parameters the next activity involves the LPG controller calibration.

After setting the auto calibration the software will sequentially switch the controller from petrol into gas, and generate the corrections to finally input final values into the controller after a few such cycles.

For this controller type, auto 'calibration cylinder by cylinder' is possible.



Upon successful process of calibration the controller may be switched into 'AUTO' mode and perform the test drive.

In special cases when the corrections are generated in the auto calibration process and differ from correct values, the application informs the user. There are two situations possible:

The size of LPG injectors chosen is too large, and therefore during the auto calibration the following message is displayed:

Generated correction: 0.3 ms does not fit recommended limit between 0.5ms and 2.5ms. Changing injectors into smaller ones is recommended.

When the LPG injectors are too small, the following message may be displayed:

Generated correction: 3.2 ms does not fit in recommended limits between 0.5ms and 2.5ms. Changing injectors into smaller ones is recommended.

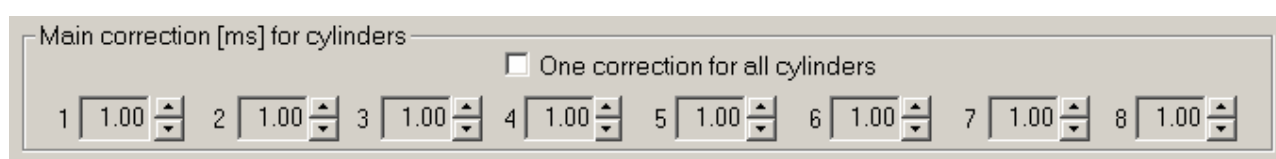
These messages do not stop the process of auto calibration and only indicate the necessity of replacing used LPG injectors nozzles.

Option 'Auto calibration cylinder by cylinder' may be useful and it causes switching from petrol into LPG during auto calibration more smooth and eliminates damping during auto calibration.

During auto calibration a parameter 'Main correction' is generated. It is a correction permanent and temporary and states the LPG injections duration increase in milliseconds against fuel durations.

For correct selected LPG injectors, the main correction should incorporate between 0.5 ms and 2.5 ms.

The correction is generated automatically in "Auto calibration", but it is also possible to be amended manually. In the case of manual amendments, different main corrections may be specified for the chosen LPG injectors (various engine cylinders).



Cylinder	1	2	3	4	5	6	7	8
Correction [ms]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The described situation is presented below: even cylinders have a different correction from the odd ones.

Note: The procedure 'Auto calibration' generates only one main correction for all cylinders.

For manual modifications of the Main correction it is handy to change it using the indicator next to the value indicated



Injector settings.

The tab 'Injectors' shows special settings and options of AGIS OBD CAN controller, connected with LPG injection controlling.

Some of the important settings are described below:

- type of used LPG injectors and connected control and warm-up parameters,
- injector configuration, meaning the way the LPG injectors signals against petrol injectors signals should be controlled (full sequence, semi sequence or non sequence),
- option 'Exit from cut-off by petrol', which may be useful when using reducers, which increase significantly the pressure on the LPG injector rail entering the cut-off conditions.
- LPG injectors current limit, Full current impulse, Warming impulse, warming time – they are parameters which are choosing automatically after choosing the injector type, all this parameters are factory settings given for us from injector producers and normally should be not change. Only in situation when installer wants to use injectors not listed, he can operate with

parameters above to get finally correct impulse characteristics for any injector he wants, knowing coil resistance.

-Injectors warming up -After enabling that options we can set period of time for which the gas injectors coils should be preheated by single pulses from ECU (properly shortened so they won't cause opening of injector) before first changeover to gas (function works only if the reducer temperature is less than set warming off temp..... C degree). The length of pulse is being set automatically depending on the type of selected injector.

- minimum petrol time transferred to lpg: this parameter sets the minimum value of petrol injectors opening time which will be moved onto LPG injectors. This option should be enabled when petrol injection controller generates very short pulses on petrol injectors (from 0,3 [ms] up to 1 [ms]), which normally doesn't cause dosage of fuel but after summing with all the corrections (main correction, multiplier correction and map correction) might cause unnecessary gas injection (partial cut-off). Default value "0" means that every pulse from petrol injector will be moved onto LPG injectors.

- Enable petrol injectors full opening mode: this option should be enabled only with cars where the injectors during high revs are fully opened. This can cause engine stalling during drive on gas. This function is, recommend, mainly to tuned cars and some cars with added dosage petrol on higher RPM.

- Exit from cut-off by petrol: this feature might be especially usefull when installed reducer(s) are making very high pressure at the outlet during cut-off conditions. If the reducer's gas pressure (differential) will exceed value given in the field "Cut-off pressure" the controller closes the gas injectors and turnover back to petrol. After the amount of time [s] given in field "Return to gas" the controller is going back to "Auto mode".

- Fast RPM fault detection: this option enables emergency switch to Petrol in case of too low RPM value (below 400 rpm) and return to LPG when RPM is higher than 400 rpm. This function helps to avoid problems in some cars with short impulse stayed on ignition coil after engine is switched off. This short impulse can be readable for LPG ECU as a normal RPM impulse and then we can have some small gas dosage in manifold when we stop engine. It could make difficulties with next start-up after long staying.

-type of petrol injection

File Factory settings Language Window Info

Settings Injectors Readings Sensors Create map Corrections Map OBD Device info Oscil

LPG injectors settings

Injectors size calculator...

Injector type VALTEK 3 OHM

LPG injectors current limit 50 %

Full current impulse 4 ms

Turn on injectors warming ☒

Warming once ☒

Warming impulse 2 ms

Warming time 30 s

Warming off temperature 50 C

Minimal LPG time 0 ms Description

Enable 'Exit from cut-off on petrol' ☒

Cut-off pressure 150 kPa

Return to LPG delay 0 s

Return to LPG emulator delay 0 s

Petrol injection type

Petrol injectors activated by +12V signal ☐

Minimal petrol time transferred to LPG 0 ms Description

Enable full petrol injection ☐

Fast RPM signal fault detection ☐

Injectors configuration

Predefined Full sequence

LPG output

1 2 3 4 5 6 7 8

Petrol input

1 2 3 4 5 6 7 8

Injector nozzle diameter

at reducer pressure 100 kPa

Power [HP] 120

Cylinders 4

Injection type Full sequence

Calculate 2.4 mm

Petrol Auto LPG RPM 951 Pressure 84 kPa Temp.LPG 50 Temp.Red 70 C

Petrol DEMO

CONNECTED

T. petrol 2.75

T. LPG 4.75

Mixture lean Mixture rich

The LPG controller may work, depending on the petrol injection type in the following modes:

Injectors configuration

Predefined Full sequence

Full sequence

Non sequence

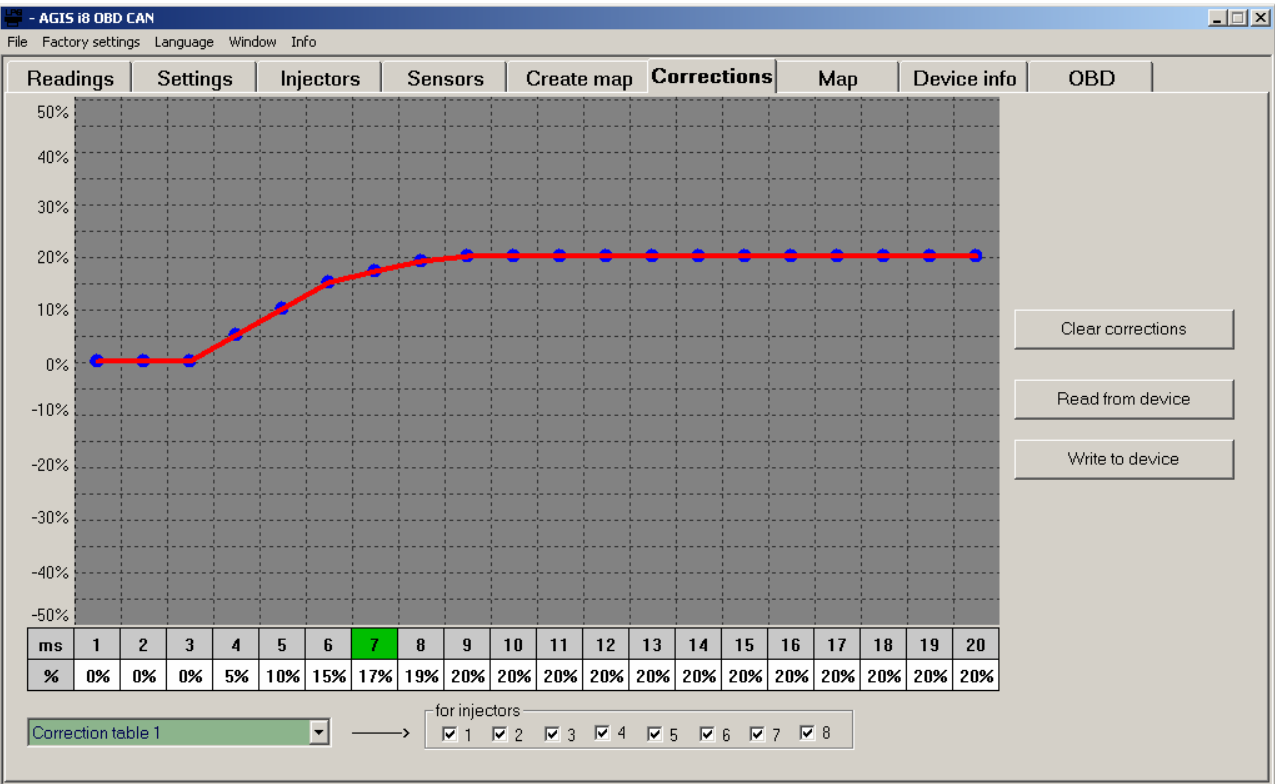
Half sequence 1,3,5,7 & 2,4,6,8

OTHER

It is possible to detect the control type by the petrol injection system providing that all petrol injector control signals are connected to the controller (each injector with own LPG controller emulator).

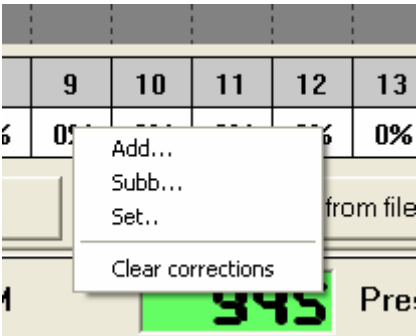
Corrections for injections duration.

The corrections table placed below the graph helps to set the LPG controller correctly depleting or enriching the mixture with tolerance +/- 50% for sequences of petrol injections duration.



The green square on the injection duration scale indicates actual petrol injection duration.

Corrections are to be input into fields upon marking the group of cells and opening the menu.



With the right mouse click.

Edition of single cells is possible by double click on the cell, which is shown in the drawing below:

	6	7	8	9	10	11
5	0%	0%	0%	0%	0%	0%

Note:

To activate the corrections it is required to input it into the device.

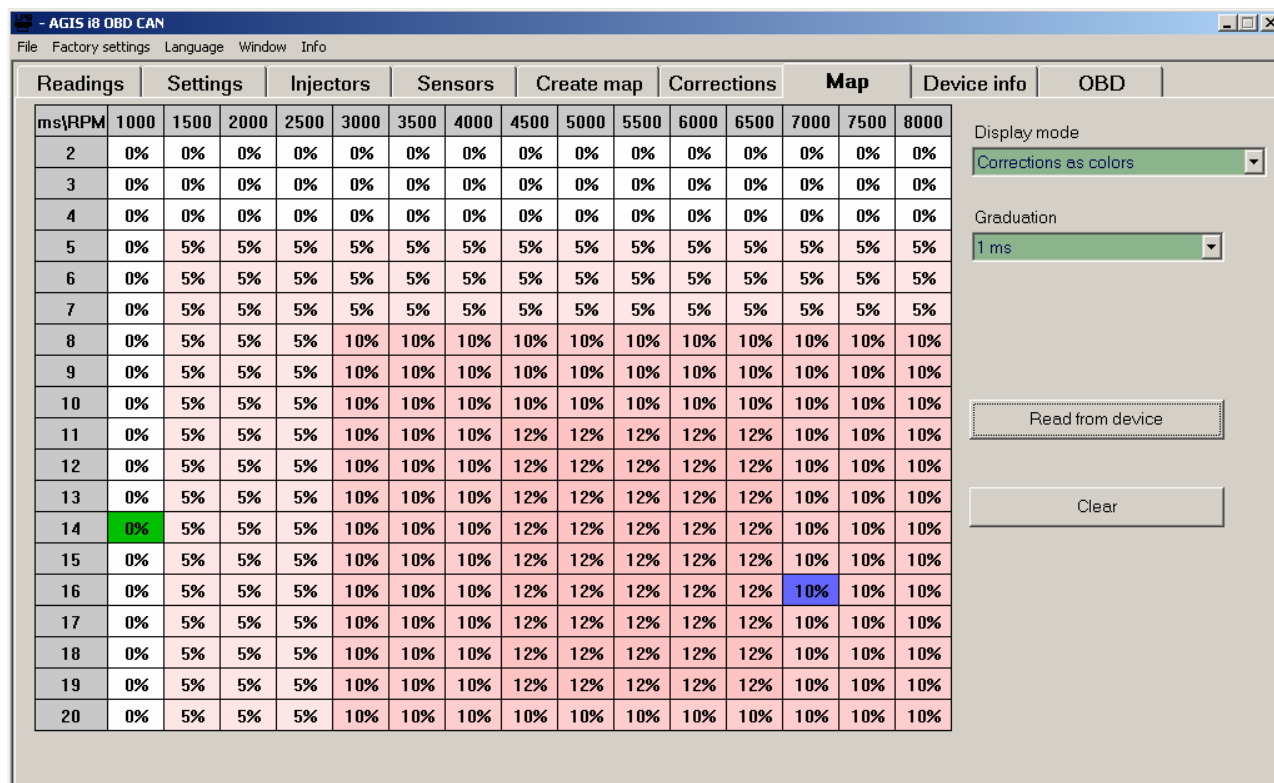
Application of two correction charts for two groups of cylinders is possible.

Note:

Corrections made in the tab CORRECTIONS and MAP total up.

Map of corrections

The AGIS OBD CAN controller enables a very precise adjustment of the mixture in every engine work area. It is shown in the map of corrections in the tab 'Map'.



The above graph shows a sample map of corrections, which may enrich the LPG mixture for high and low revolutions up to 12%.

Using the map enables corrections of the LPG mixture within a range between -50%and+50%.

The edition of map cells is identical as for tab 'Corrections'.

Note: The map should be input into the device to start working.

The green square on the map indicates present engine work conditions, meaning the petrol injection duration and revolutions.

Default limit on the map for injection duration are from 2 to 20ms every 1ms. Changing the scale on the map for injection duration is possible from 1 to 10ms every 0.5ms, for more precise correction input.

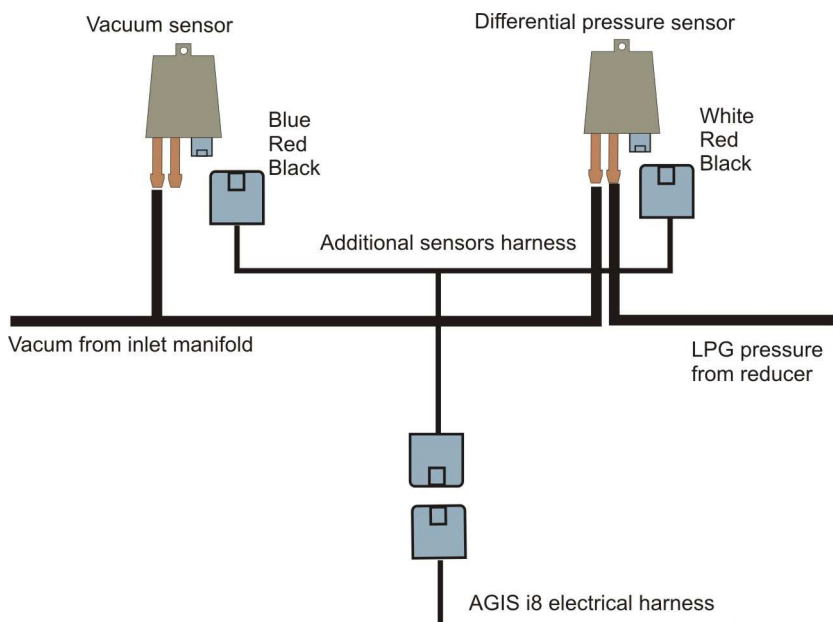
Automatic calibration during driving (Mapping).

Connection diagram only for MAP SENSOR PS4250DP type.

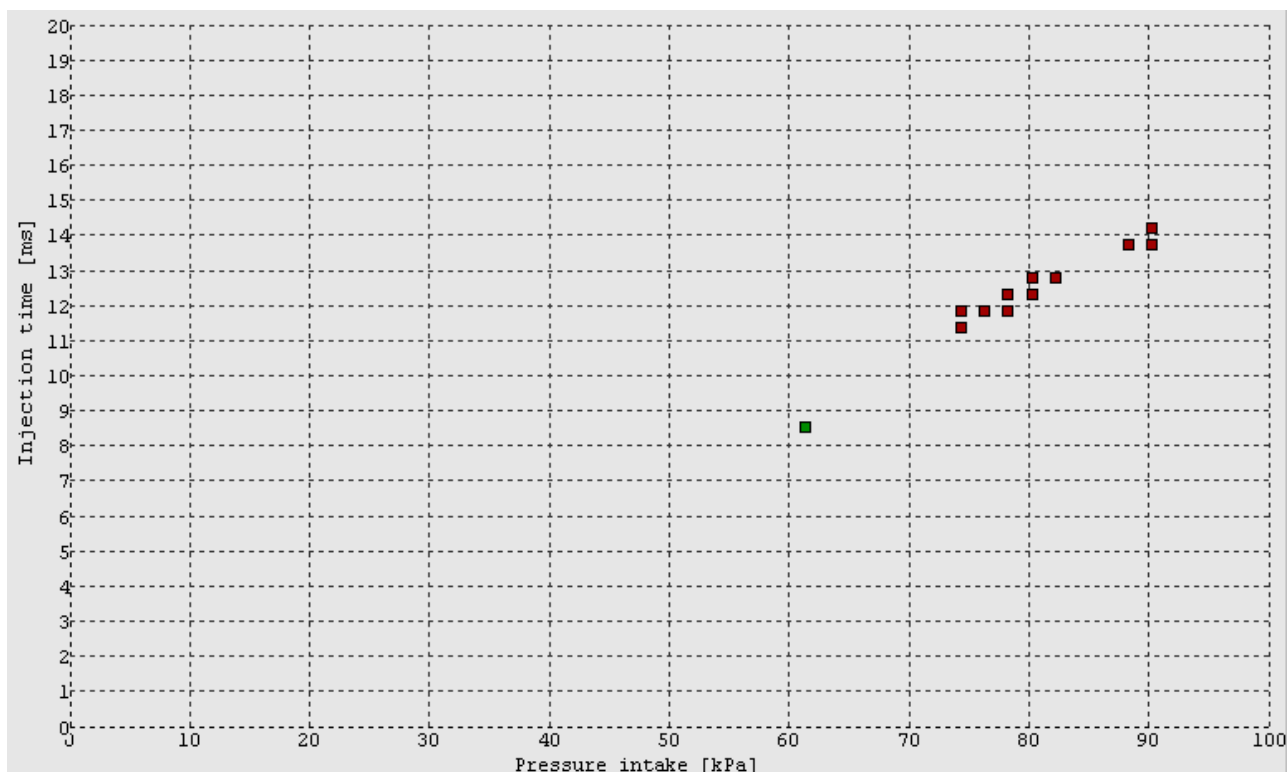
MAP SENSOR MPXHZ 6400A , doesn't need any map to be switched for mapping.

Automatic car calibration during driving is possible upon connecting an additional sensor for measuring the negative pressure in the engine intake passage.

Connection should be done in accordance with the chart below. Additional loom for connecting another pressure sensor is supplied upon customer's request.



The next step after connecting the negative pressure sensor is the tab 'Mapping', which shows present negative pressure in the scale from 0 to 100kPa and test points, currently updated during driving.



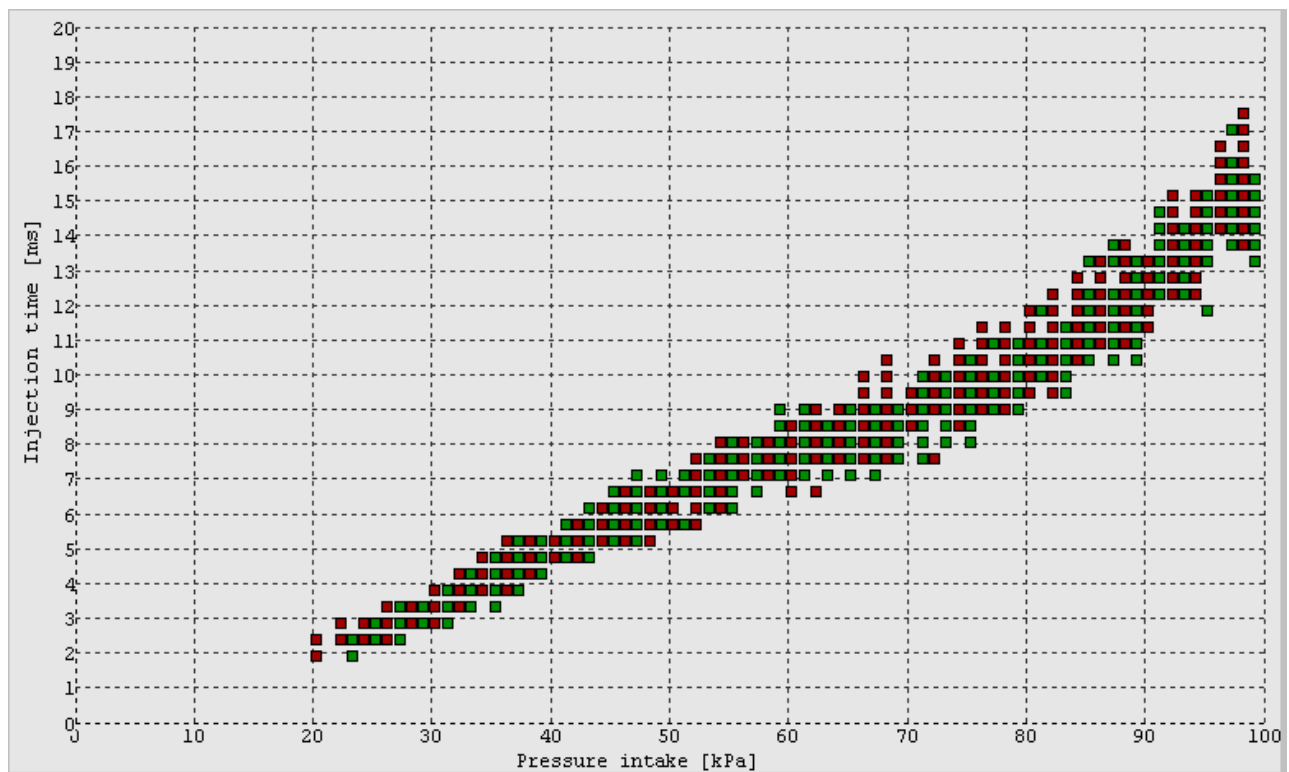
The assumption is: small load corresponds with negative pressure below 40kPa, High load corresponds with negative pressure above 90kPa.

During car calibration, the program generates reduced injection maps for petrol controller during driving on petrol and LPG. Afterward the program generates corrections for both the maps to agree. Generated corrections will be suggested for input on the tab 'Corrections'.

Note: Automatic car tuning during driving should be done upon auto calibration on standing.

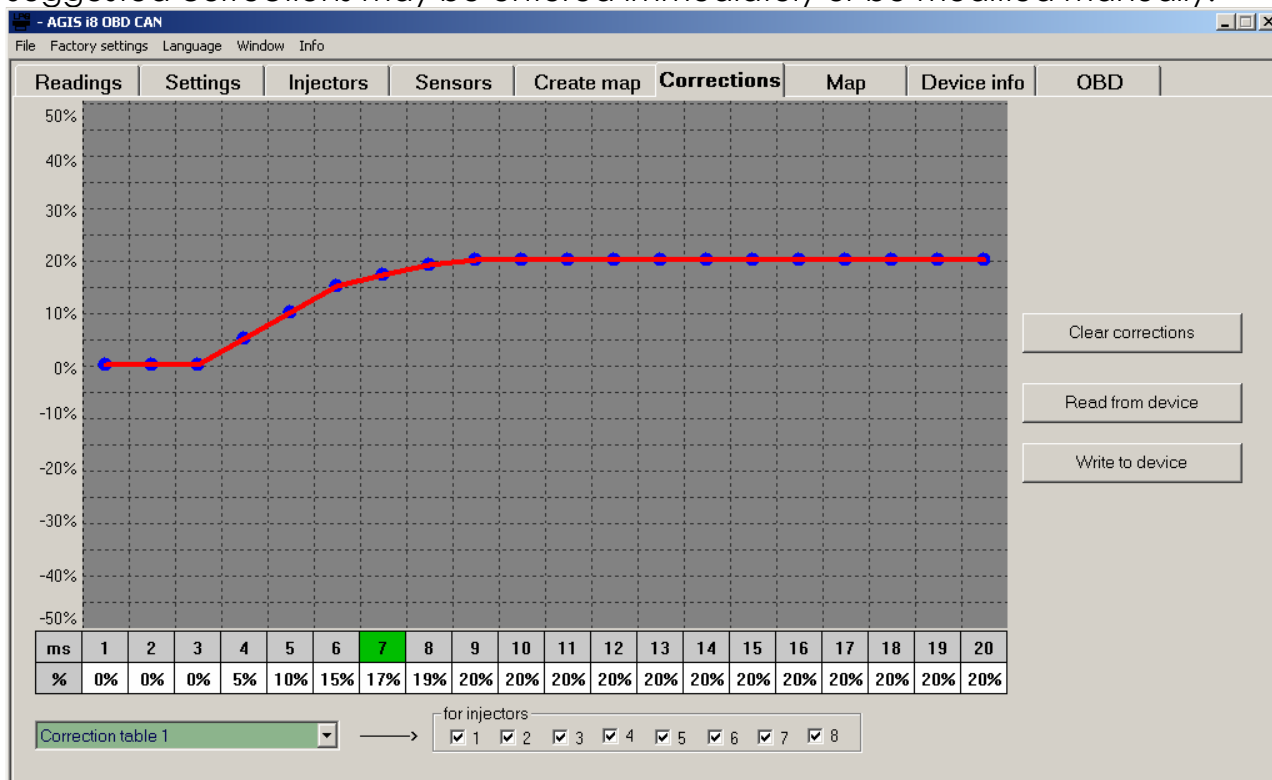
The calibration procedure during driving is as follows:

1. Switch the AGIS controller to petrol and press Start.
2. Perform test drive on petrol trying to collect the most points equally on the whole negative pressure scale (from about 30kPa to 100kPa).
Notes concerning driving:
Driving should be performed the way that the Lambda probe works continuously i.e. avoid long acceleration with the accelerator pressed maximum.
Optimal driving time is about 10 minutes.
3. After driving on petrol, switch the AGIS controller into LPG mode and perform the same test drive on LPG.
4. Upon finishing the drive on LPG stop computation (key 'Stop'). The map should be equally marked with points generated on petrol and LPG:



5. Press key 'Generate corrections'. The program switches to the tab 'Corrections' with the set corrections:

Suggested corrections may be entered immediately or be modified manually.



Note: suggested corrections are not entered automatically. It should be input overtly with the key 'Enter into the device'.

In this controller version there is an option of collecting points for mapping without connected PC software. It may be done using the option „Map computed in device“. Upon selecting this option the LPG controller registers the points during driving on petrol and gas. For mapping, load the petrol and gas maps from the controller and then press the key ‘Calculate corrections’.

(In this option the additional pressure sensor should be left in the car for the map collection duration). The map is collected by the car owner or mechanic during the test drive, on condition that from time to time the petrol/gas supply is manually diverted the way that points are collected for both types of fuel. After test drive finishing, connect the computer, open the tab ‘mapping’, load the map from the controller, generate corrections and save in the device.)

Sensors

The tab ‘Sensors’ shows a chart, which helps to select the right LPG level sensor or its calibration if the installed sensor is not the standard one. There is also a possibility of selecting temperature sensors for others than the standard AGIS system sensors (10kOhm) and also selecting the type of Lambda probe.

The screenshot shows the 'Sensors' tab in the AGIS i8 OBD CAN software. The interface includes a menu bar (File, Factory settings, Language, Window, Info) and a tabbed interface with tabs: Readings, Settings, Injectors, Sensors (active), Create map, Corrections, Map, Device info, and OBD.

LPG level sensor section:

- Reading: 12
- Sensor type: AEB1050 sensor (dropdown)
- Color-coded bars: Green (1/1, 3/4, 1/2), Red (1/4), and Reserve.
- Values: 45, 140, 180, 230.

Temperature sensors section:

- Reducer temperature sensor: 10 kOhm (dropdown)
- LPG temperature sensor: 10 kOhm (dropdown)

Sonda Lambda section:

- Lambda type: 0-1 Volt (dropdown)
- Secondary Lambda sensor connected: ☐

Buttons: Read from device, Write to device.

Calibration of the gas level sensor.

As shown in the chart, the controller is configured in the following manner:

Parameters for level sensor AGIS CPP:

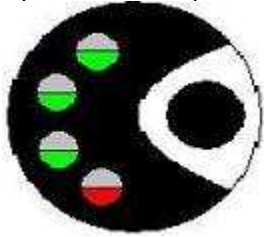
complete	if: indication <= 50
three quarters	if: 241 < indication < 140
half	if: 249 < indication < 180
one quarter	if: 253 < indication < 230
reserve	if: indication >= 230

Setting for typical sensors will be suggested automatically upon choosing relevant type from the list. The controller operates the following types of sensors:

- **AEB 1050 and similar,**
- **AGIS CPP**
- **reserve sensor,**
- **sensor 90 ohm.**

Description of the LPG control panel.

1) Automat (before switching to LPG, LEDs are flashing simultaneously)

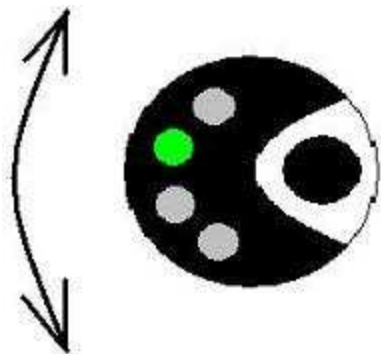


2) Petrol (Leds off)



3) LPG finished (after switching into petrol, the leds switch on sequentially)

Switching into petrol after the pressure reduction caused by an empty LPG tank is indicated by the control panel by flashing of each LED sequentially: one goes on when the previous one goes off (an effect of floating diodes).



4) After switching into LPG, the control panel shows its amount in the tank:

LPG – full tank



LPG - 3/4 of the tank



LPG - 1/2 of the tank



LPG - 1/4 of the tank



LPG - Reserve (red LED flashes)



Review and deleting the error codes.

The tab 'Device info' shows a board with all codes errors saved in the controller.

Can't read error codes from device
EEPROM files(*.eeprom) | *.eeprom |
Can't open EEPROM file
Invalid EEPROM file format!
Can't write to device EEPROM
Can't read from device EEPROM
Can't clear device error codes
Can't read device error codes
Device not responding for diagnostic frames!
Can't write settings to device!
LPG device errors:
Can't write settings to device!
Can't switch to LPG mode!
Autocalibration procedure failed or was aborted!
Can't switch to AUTO mode
Autosetup procedure error
Can't open diagnostic file for writting
Can't open diagnostic file for reading
Can't switch to gasoline mode
Can't switch to AUTO mode
Can't switch to LPG mode
Can't write settings to device!
Can't write LPG level sensor settings to device
Can't read LPG level sensor settings from device
Can't read LPG level sensor settings from device
Do you want to write settings to device?
Can't communicate witch LPG device
Can't read device version!
Invalid value of switching RPM\nInvalid value of switching temperature\nInvalid value of ignition count per cycle\nInvalid value of minimal supply voltage\nInvalid value of max inside temperature\nInvalid value of main correction\nInvalid value of second main correction\nInvalid value of pressure correction gain\nInvalid value of pressure reference\nInvalid value of emulator part enclose delay\nInvalid value of switch to gasoline pressure\nInvalid value of turn on LPG injectors current limit delay\nInvalid value of LPG injectors current limit\nInvalid value of switch to LPG delay\nInvalid value of pressure average cycle count\nInvalid value of heater valve on temperature\nInvalid value of heater valve off temperature

Invalid value of voltage correction reference\n
Invalid value of voltage correction\n
Error reading gasoline injector signal:
Error reading LPG temperature sensor\n
Error reading heater temperature sensor\n
No RPM signal
Error reading pressure sensor
Error reading LPG temperature sensor
Error reading heater temperature sensor
Error - supply voltage too small
Error - internal temperature too high
LPG Injector 1 error
LPG Injector 2 error
LPG Injector 3 error
LPG Injector 4 error
LPG Injector 5 error
LPG Injector 6 error
LPG Injector 7 error
LPG Injector 8 error
Error - no diagnostic data!
ERROR

The error may be deleted after correcting the error by pressing the key 'Clear errors'.

This page contains also information about controller version, serial number, manufacture date and petrol, LPG work duration statistics.

AGIS i8 OBD CAN - LPG

File Factory settings Language Window Info

Settings Injectors Readings Sensors Create map Corrections Map OBD Device info Oscil

Device version

VersionAGIS OBD CAN v2.80.5

Injectors count8

Serial Nojz001

Date of production21/06/2008

Statistics

Work on petrol [hh:mm:sec]0 : 00 : 15

Work on LPG [hh:mm:sec]0 : 00 : 22

Device settings modification counter1

Last modified by903C-1D60

Current user IDE07C-CF52

Service control

Device errors

Maintenance control

☒ Enable service signalling

Maintenace required for15863 km (100 : 20000km)

(1 hour on LPG = 50 km)

Time to service317 h

OK

Read from deviceClear errors

PetrolAutoLPG

LPGDEMO

CONNECTED

RPM960

Pressure99 kPa

Temp.LPG50

Temp.Red70 C

T. petrol9.50

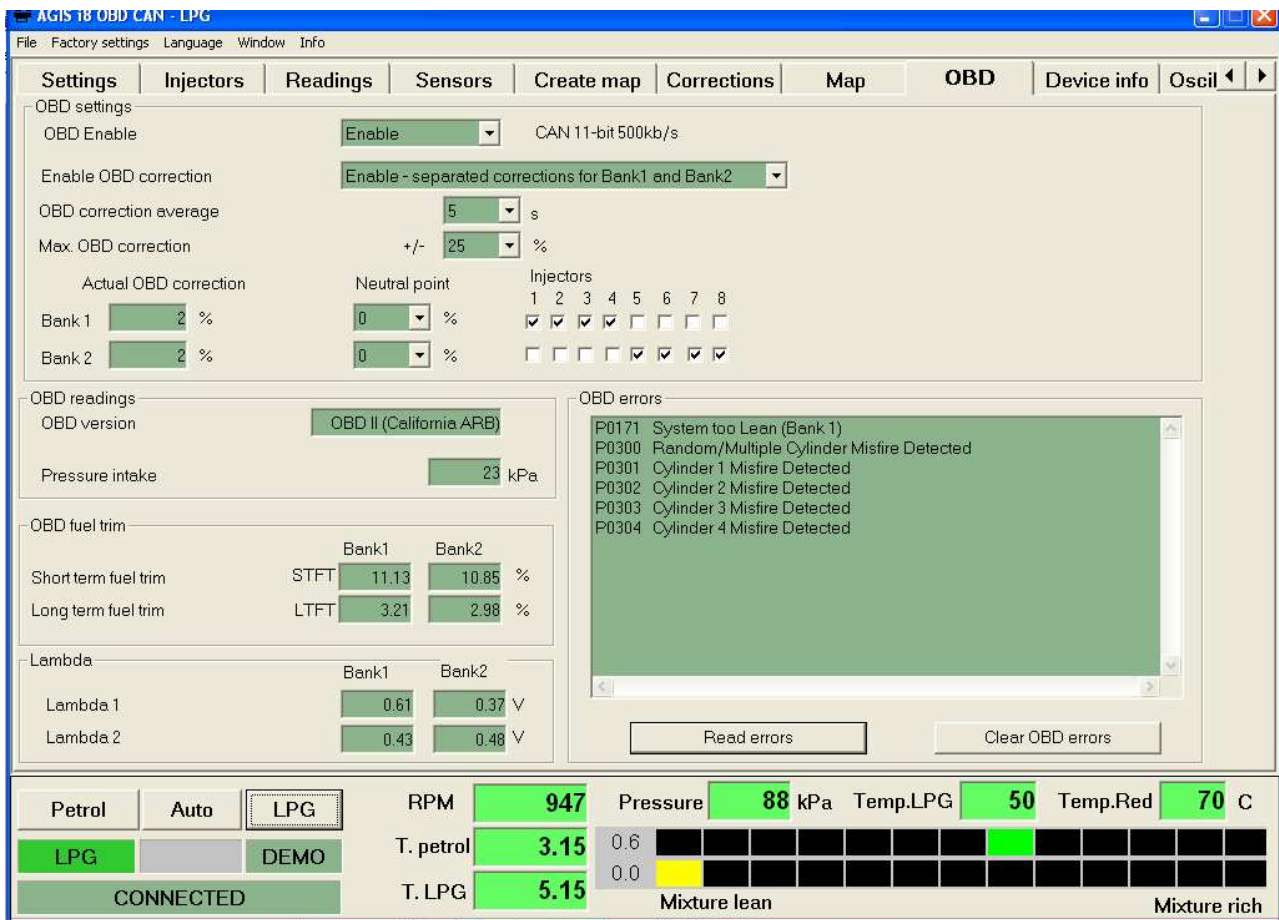
T. LPG11.50

Mixture leanMixture rich

OBD CAN functions

The AGIS OBD CAN controller enables connecting to the OBD system through the CAN controller area network and loading current work parameters and OBD error codes. For applying these options it is necessary to use the CAN L and CAN H AGIS system loom and connect it to the OBD connectors.

After connecting to the OBD system and setting the option 'OBD switched on' we can observe the selected parameters in the AGIS application.



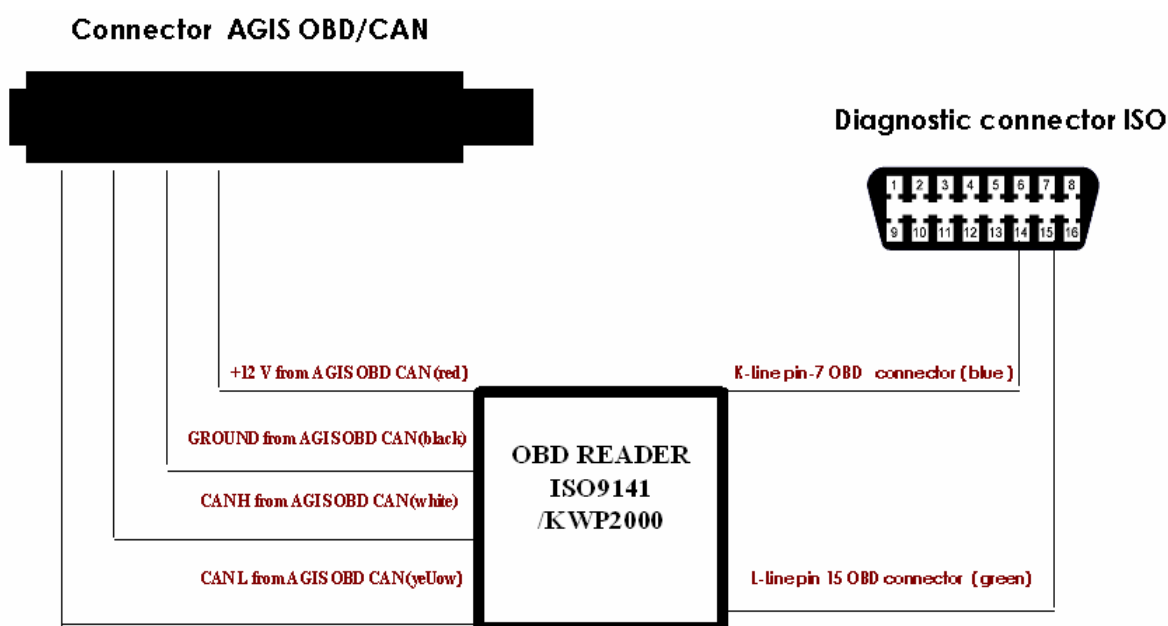
After clicking the button "Read errors" it is possible to read the OBD errors written in original car's petrol controller. We can clear these errors from its memory by pressing button "Clear OBD errors". By enabling option "Enable OBD corrections" we have possibility to correct gas injectors opening time according to actual readings of "Long Term Fuel Trims", separately for each petrol BANK data 1 and 2. The time interval of reading the corrections can be set in parameter "OBD corrections average". Thanks to above feature the work of gas injection controller is self-adapting itself to car's original OBD in real time. If elements rest of sequential gas injection system has been chosen and installed properly it makes possible to eliminate MIL ("check engine" light) during drive on gas and has all the time the same parameters of petrol ECU

during driving on LPG. This function helps avoid problems with destroyed map in petrol ECU during driving on LPG with incorrect settings of mixture.

Attention: Feature "Enable OBD corrections" might be used only in cars which are having OBD on CAN bus, because only this type of data bus is capable to ensure proper communication quality with the controller. For some cars with older OBD transmission like KWP 2000 and ISO 9141-1, ISO 9141-2, we have also a choice. We recommend to use also our second device OBD READER. This device is destined also for making automatic corrections with much slower data transmission.

Please pay attention for connecting OBD READER DEVICE.

See diagrams below:



Connection OBDCAN to ISO9141/KWP2000 converter:

Use OBDCAN to ISO9141/KWP2000 converter with AGIS OBD CAN controller in case when car doesn't have OBD on CAN bus but has OBD with ISO9141/KWP2000 protocol. (Pin 7 and optional 15 are present in OBD connector) In case when pin 15 (L-line) is not present do not connect green wire of converter (NC). In case when both pin 7 and 15 not present do not connect converter to any other pins

. It means that vehicle has another OBD protocol (VPW or PWM) which is not supported by converter. Power supply and ground to converter should be taken from AGIS OBD CAN wires (+12V after ignition key and GND from main GND) CAN H i CAN L wires of converter must be connector to AGIS OBD CAN bus signals.

Recommended value for "Adjusting the ODB corrections" parameters is as shorter as better. In some cases 2 sec is recommended time for reading corrections. This parameter sets the time interval after which the averaged value of Long Time Fuel Trim is being read.

Parameter "Maximum OBD correction" shouldn't be bigger than +/- 20-25 % for european and japanesse cars and about +/- 45 % for most amercican cars. This parameter sets the maximum

value of Long Time Fuel Trim which gas controller will try to adjust by changing petrol injection opening time during driving on LPG and comparing to ideal parameters in petrol ECU.

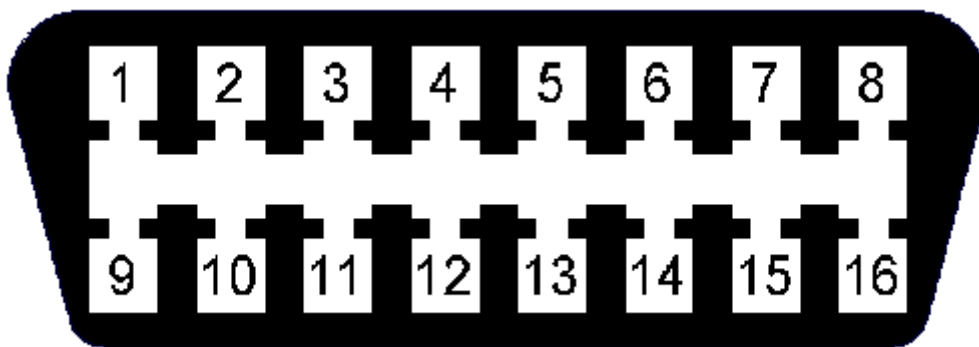
AGIS OBD CAN controller reads the value of mixture correctors from OBD petrol ECU and sets the amount of fuel injected so the „Long Time Fuel Trim” (LTFT) will be oscillating as close to expected car's manufacturers default values as possible. STFT and LTFT mixture correctors are referring to the corrections dynamically imported to table of injection opening times in original petrol ECU.

Corrections are showed up as a percentage. Positive value means that in that particular moment the mixture is too lean and petrol ECU is trying to elongate the petrol injectors opening time to enrich it. Negative value means that mixture is too rich and petrol ECU is trying to shorten the injection opening time to make it leaner.

The concept of banks is referring to “V” type engines. Cylinder marked as no. 1 should be always in bank no. 1. “V” type engines should always have one side assigned to bank no. 1 (cylinders with numbers from 1 to 3 or from 1 to 4) and another side to bank no. 2 (cylinders with numbers from 4 to 6 or from 5 to 8). Of course this type of cylinders assignment is made in case when each bank has his own oxygen sensors. There are also a V type engines with one oxygen sensor for two banks then it's recommended to choose average corrections from BANK1 and BANK 2. So generally the numbers of oxygen sensors before catalisator is recommending the type of automatic corrections. Algorithm of controller's adaptation in dependency of OBD corrections is basing on reading actual values of STFT and LTFT and depending on these values elongating or shortening gas injection opening times. In result of such actions mixture is being enriched or leaned to keep the STFT and LTFT in desired range.

Actual value of calculated corrections we should control from time to time. To big absolute value of these correction mean that some mechanical part might be worn out and we should make some mechanical adjustments to some parts of sequential gas injection system.

Description of the OBD II connection



Pin 4 - ground

Pin 5 - ground

Pin 6 - CAN High (J-2284)

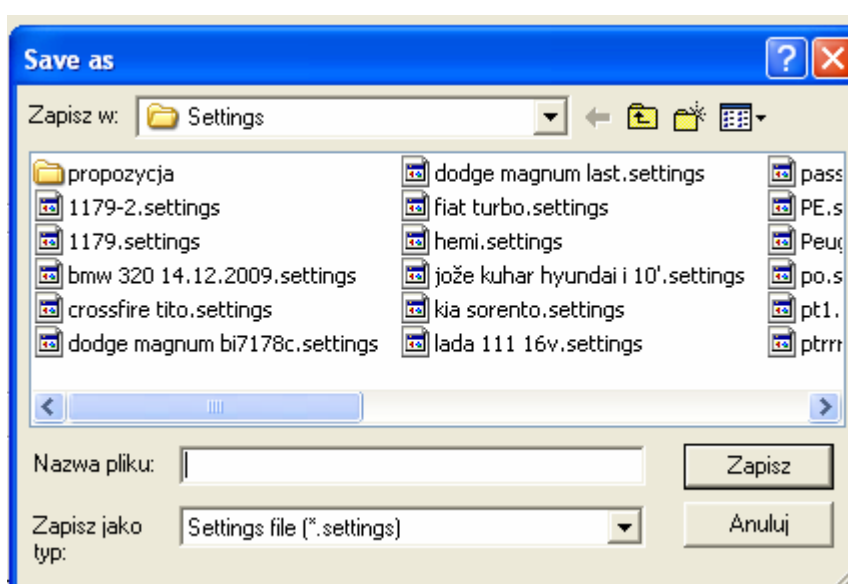
Pin 14 - CAN Low (J-2284)

Pin 16 - +12V

If the car has the OBD on the CAN then the pins 6 and 14 should have voltage +2.5V against the mass. The OBD system on the CAN was introduced in the USA in cars manufactured after 2003.

Saving car setting into file

After choosing the menu 'File -> Save settings to file...' a window displays and the data about the car as well as information about the installation should be input.

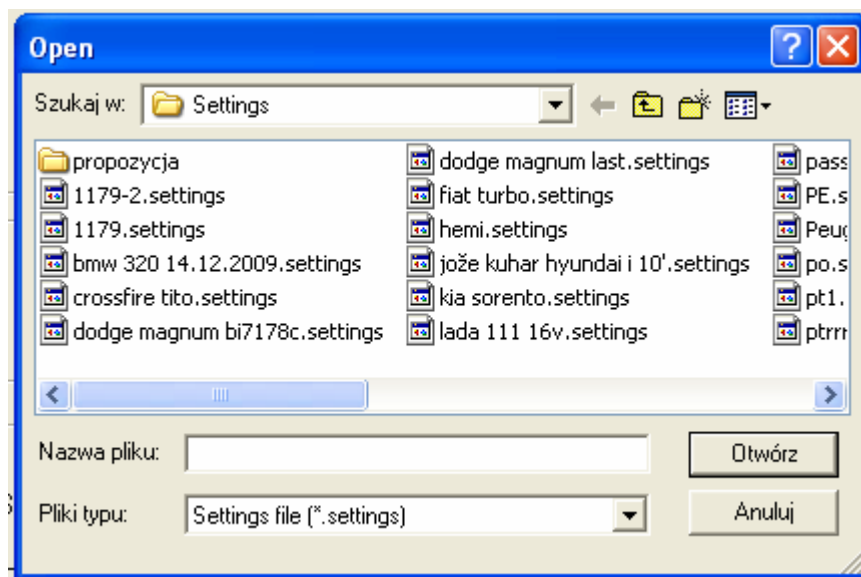


It enables creating a car data base with saved settings.

For using the base, one can input setting choosing the required car. It is done with a key "File -> Read settings from file."

After pressing it, a dialogue window is displayed giving a possibility of searching and choosing setting for the required car:

After pressing the key "Select" an appropriate form will be filled with the same settings as the chosen car. All what should be done is to input the settings into the controller



OSCILOSCOPES

