

# ***USERS MANUAL***

## ***EZ-SGI***



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## 1 EZ-SGI

EZ-SGI is a software program allowing for self calibration of a sequential injection LPG system. EZ-SGI is installed on a laptop. It is designed for engines with the following specifications:

Naturally Aspirated.

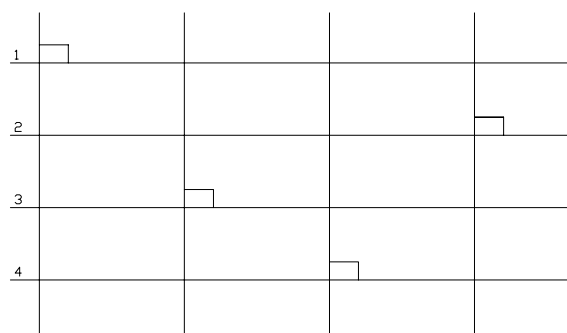
Maximum of 4 cylinders.

Maximum power of 103 kW (140 hp).

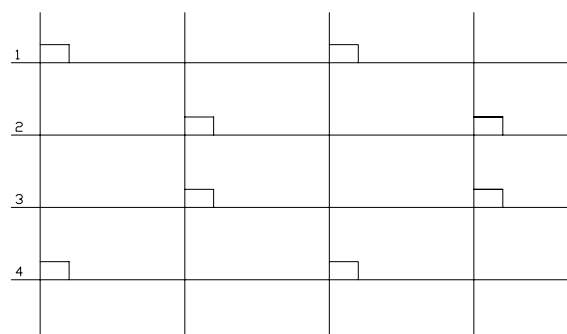
Sequential or semi sequential.

The images below show the sequential, semi sequential and simultaneous injection strategy.

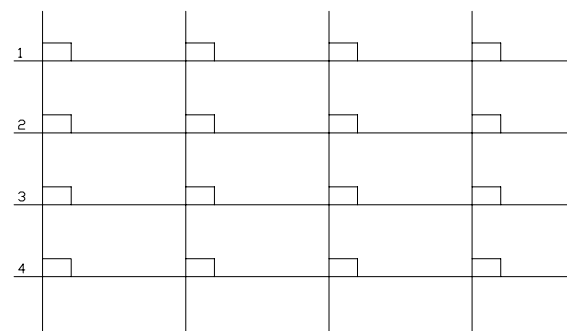
**EZ SGI is not possible on engines with Simultaneous injection strategie or Direct Injection.**



Sequential timing



Semi sequential timing



Simultaneous timing

EZ-SGI is installed on a laptop, which is connected to the AG EZ-SGI ECU of the LPG installation.



*The EZ-SGI computer*

After filling in the data about the engine, the petrol-injection system and the EZ-SGI LPG system, you have enough basic information to obtain data during a drive on LPG and Petrol. With this information the EZ-SGI system is able to automatically generate a calibration.

The following issues will be discussed in this Users Manual:

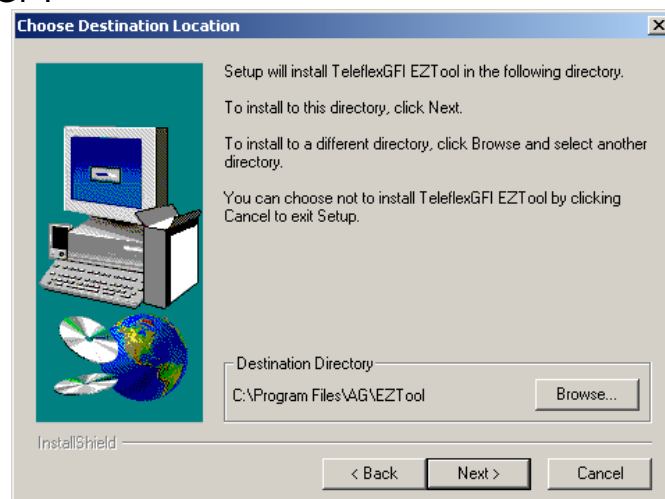
- Installation EZ-SGI Tool.
- Connecting the Laptop to the car.
- Working with the EZ-SGI Tool
- Making standard settings.
- Obtaining data during driving.
- Generating a calibration.

## 2. Installation EZ-SGI Tool.

EZ-SGI can be installed easily by running the accompanying installation program. For this the file “Setup.exe” on the CD rom has to be clicked in Windows Explorer using the left mouse button. Subsequently the installation procedure will start. You should start at the top with the installation of the Dongle drivers.



After this you should install the EZ Tool as a standard procedure during the installation it will be recommended to install the program in the directory: “C:\Program Files\ AG \ EZ-SGI ’.



If you wish you can choose another directory. After the installation is finished a shortcut to the EZ-SGI program will be placed on the desktop (EZ-SGI logo). If this logo is double clicked the program starts running.

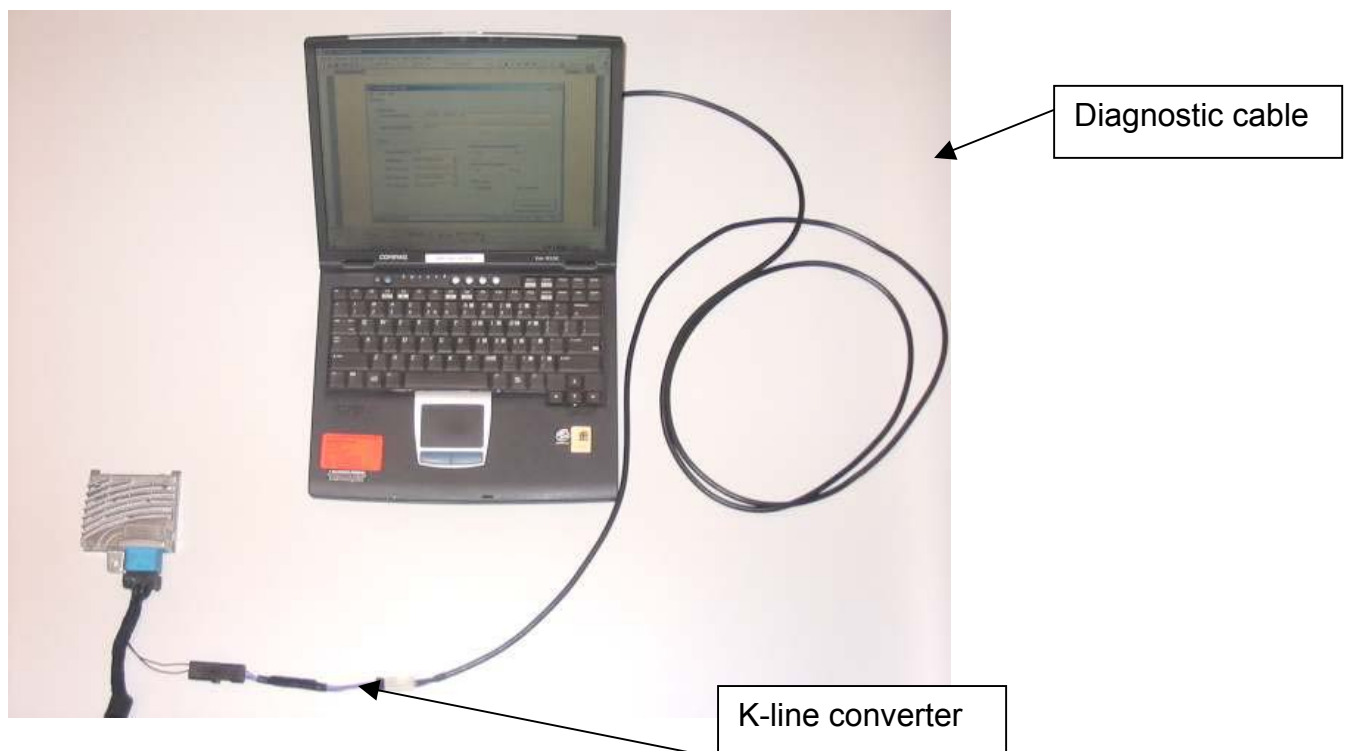
The installation of the Diagnostic Tool is the same.

On the CD you can also find this manual and the instruction manual.

## **3 Connecting the Laptop to the Car.**

In order to run the EZ-SGI calibration using a laptop, a connection has to be made through the diagnostic cable, which is connected to the 3-pin diagnostic connector, which is near the EZ-SGI computer connector in the engine compartment. This cable is equipped with the K-line converter, which allows the EZ-SGI computer and the laptop to communicate with each other.

Description	TeleflexGFI Part Number
1 Diagnostic cable	258110
2 K-line converter	258111



Communication is solely possible when the EZ-SGI computer is receiving power from the ignition key. Both on LPG and Petrol, communication is usually only possible when the engine is running, because the power of the ignition key is usually omitted when the engine stalls.

First the EZ-SGI Tool program has to be installed on a laptop, which will be used for communication. The program is developed for use on a PC running with Windows 95, 98, NT, 2000 or XP.

The laptop must have:

- a RS232- and a USB port.
- or a RS232 and a parallel port.

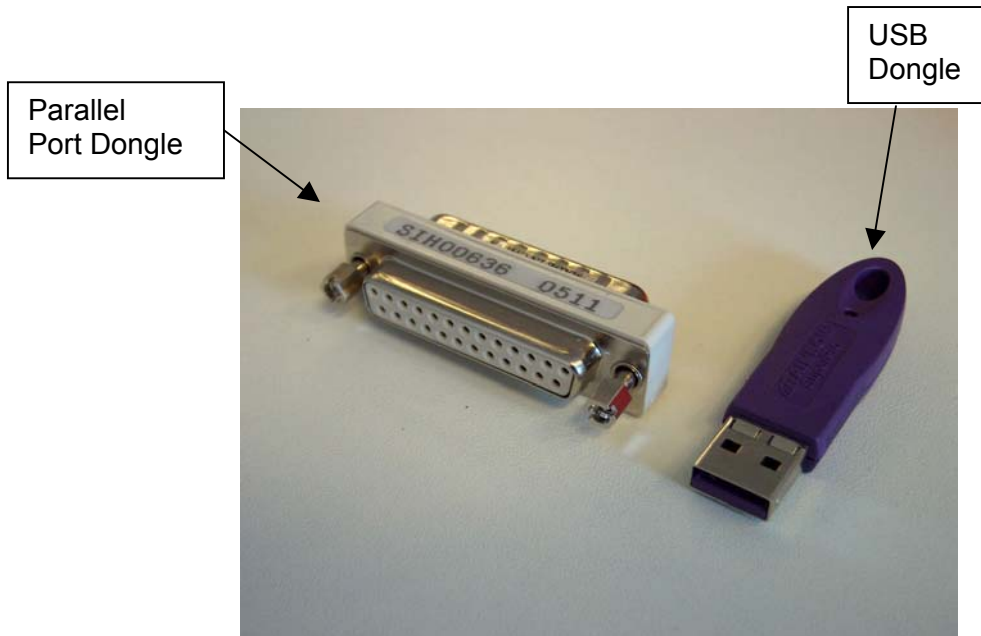
Electronic Key:

By using an electronic key (Dongle) the user will be registered in the software of the EZ-SGI Tool.

**Without the Dongle the EZ-SGI Tool will not work.**

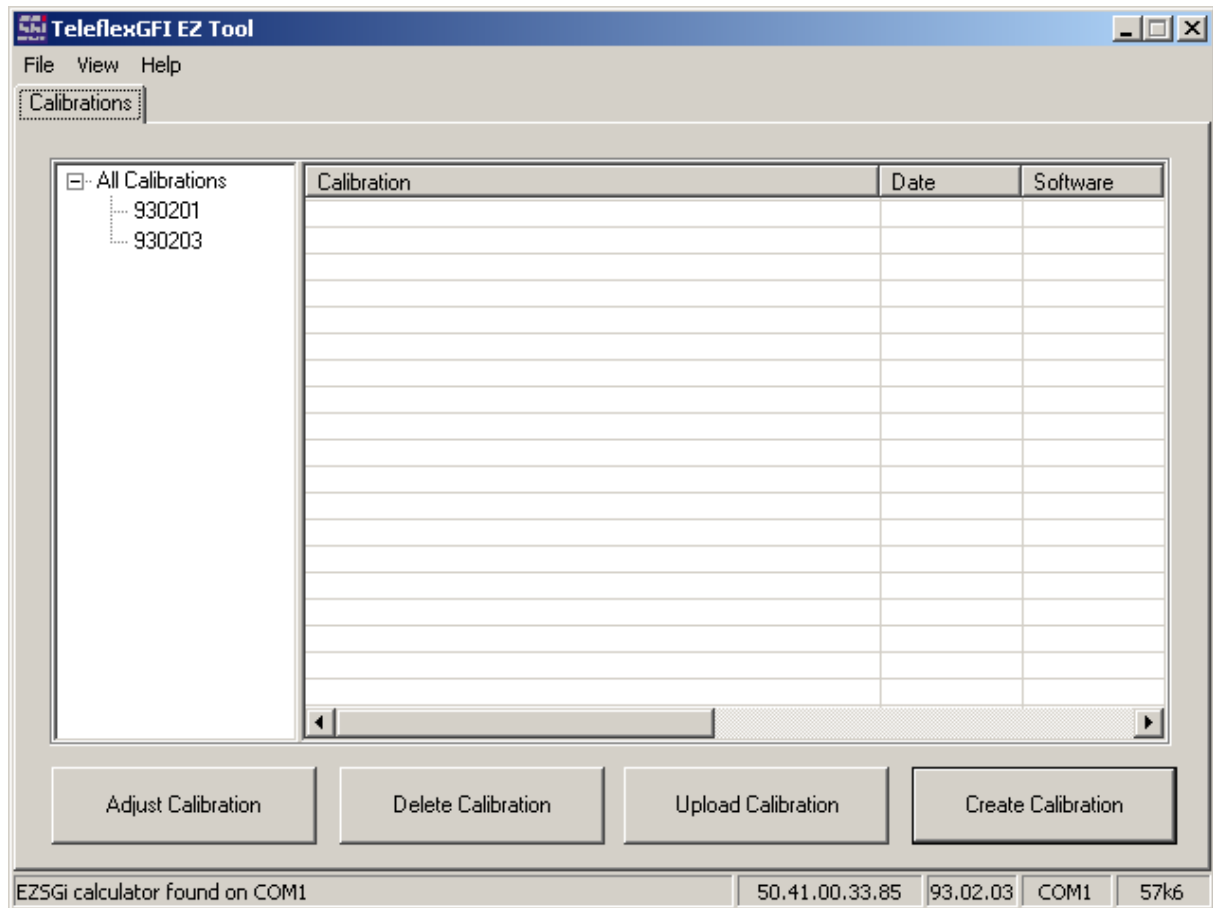
In our standard delivery we have a USB Dongle. At your request it is possible to order a parallel port Dongle.

The Two Dongle Versions:



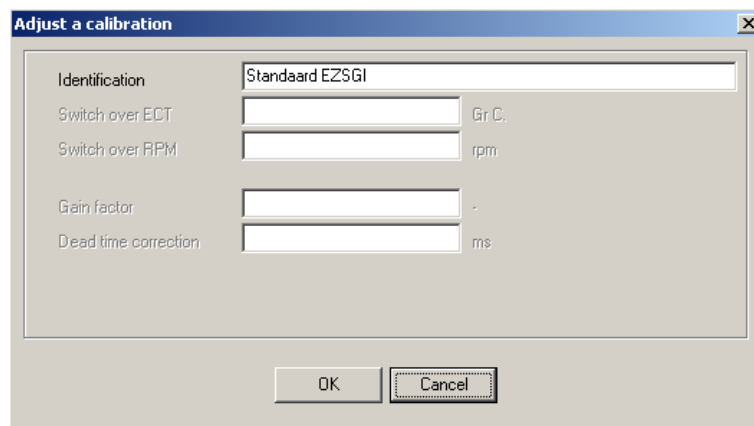
## 4 Working with the EZ Tool.

The installation of the EZ Tool will place an EZ Tool icon on the desk top, if you double click this icon with the left mouse button, you will get the following screen.



Adjust Calibration:

With this option it is possible to load an existing calibration, and adjust it to the concerning car.



## **Delete Calibration**

With this option you can delete calibrations.

## **Upload Calibration:**

With this option you can upload a calibration that has been made earlier for an identical car. After selecting the calibration and pressing the button the calibration will be uploaded automatically and saved when you turn off the engine.

## **Create Calibration:**

With this option you start creating a new calibration.

## 5 Making Standard Settings

There are a number of base vehicle factors that have an influence on the calibration. For example: the EZ-SGI Tool will not be able to detect which type of LPG injector is mounted to the car.

The following items need to be filled in on the screen "Settings" before EZ-SGI can start obtaining the data:

- Identification;  
*Software*, is displayed automatically  
*Calibration*, create your own logical name.
- Displacement;  
Indicate in cc. For example: **1800**  
The displacement is needed to determine the translation factors. With this the basic translation is set for the calibration drive.
- Injector type;  
Open the field and select the correct LPG injector.
- Map sensor type;  
Open the field and select the correct sensor.
- Gap sensor type;  
Open the field and select the correct sensor.
- ECT sensor type;  
Open the field and select the correct temperature sensor type.
- Is a VACUUM REFERENCE used on the petrol injection system?;  
Yes / No
- Is an EGR system present?;  
Yes / No.  
If an EGR system is used, a part of the sampled data will be useless and deleted.

- Sequential petrol injection system;  
Sequential / Semi sequential  
If the petrol system is NOT sequential, the engine RPM will NOT be displayed correctly. Choose the other option when the RPM value is not correct.  
Read the instruction in the capital "INSTRUCTIONS WHILE DRIVING".

After this information is filled in, a basic calibration will be created and loaded to the EZ-SGI ECU before going further with obtaining data. Usually it is necessary to start the engine for a short time to make a connection possible with the EZ-SGI ECU. Press for this the button Upload and Continue.

**ATTENTION!** Please let the engine run as short as possible. The following measurements have to be done with an engine that is as cold as possible.

The screenshot shows the 'TeleflexGFI EZ Tool' software window. The 'Settings' tab is active. Under 'Identification', 'Software Identification' is set to '93.02.03 50.41.00.33.85' and 'Calibration Identification' is empty. The 'Settings' section contains several fields and radio buttons: 'Displacement [cc]' is '1800'; 'Injectortype' is 'SGI 600.050 [5mm]'; 'MAP sensortype' is '1.0 bar(a) Interface Unit'; 'GAS sensortype' is 'Bosch (3.5 Bar)'; 'ECT sensortype' is 'EZ SGI vapo ECT'. On the right, 'Petrol system vacuum referenced' has 'No' selected; 'Exhaust gas recirculation' has 'Yes' selected; 'Petrol system' has 'Sequential' selected. At the bottom are 'Cancel' and 'Upload and Continue' buttons. A status bar at the very bottom displays: 'EZSGI calculator found on COM1', '50.41.00.33.85', '93.02.03', 'COM1', and '57k6'.

Field	Value
Software Identification	93.02.03 50.41.00.33.85
Calibration Identification	
Displacement [cc]	1800
Injectortype	SGI 600.050 [5mm]
MAP sensortype	1.0 bar(a) Interface Unit
GAS sensortype	Bosch (3.5 Bar)
ECT sensortype	EZ SGI vapo ECT
Petrol system vacuum referenced	No
Exhaust gas recirculation	Yes
Petrol system	Sequential

Buttons: Cancel, Upload and Continue

Status Bar: EZSGI calculator found on COM1 | 50.41.00.33.85 | 93.02.03 | COM1 | 57k6

## **6 Obtaining Data During Driving**

### **Introduction:**

The purpose of obtaining data is to generate a calibration for the EZ-SGI system. The EZ-SGI tool indicates with what RPM and engine load you should drive.

### **General information:**

- Temperature sensor correction.  
To determine the correction for the coolant temperature it is necessary that the sensor value is measured with a cold engine running up until the engine reaches working temperature.
- Dynamic behaviour.  
To determine the dynamic correction it is necessary to drive in such situations in which the effect of this is the most significant. You can do this by having a relatively low rpm and a constant low load for a while and then change to a high load for a while.  
During this test no a-synchronic or post injections may occur. (if so the rpm signal is skipped)
- Static translation.  
In order to be able to determine the translation factors, driving on petrol and LPG is necessary. It is recommended to drive relatively constant to give the petrol system the opportunity to make corrections to eventual deviations. To determine the translation factors it is necessary that the conditions during driving are exactly the same on petrol and LPG!
- The generation of a calibration is being automatically completed by the EZ-SGI tool.
- After the calibration is generated, it is automatically loaded into the ECU. You can save the calibration on your hard disk, to make sure you do not have to do a new calibration drive for the same car again.
- The EZ-SGI tool uses the following 2 basic principles:
  - 1) All measured data is recorded with  $\Lambda = 1$ .
  - 2) The fuel amount is proportional to the manifold pressure (MAP).

## **Instructions while driving:**

The obtaining of data is preferred to be done on a dynamometer.

**If you use the public road you should comply with the local validly traffic rules!**

When you start driving (obtaining data) the engine must be in **cold** condition.  
This means the engine temperature is equal to the ambient temperature.

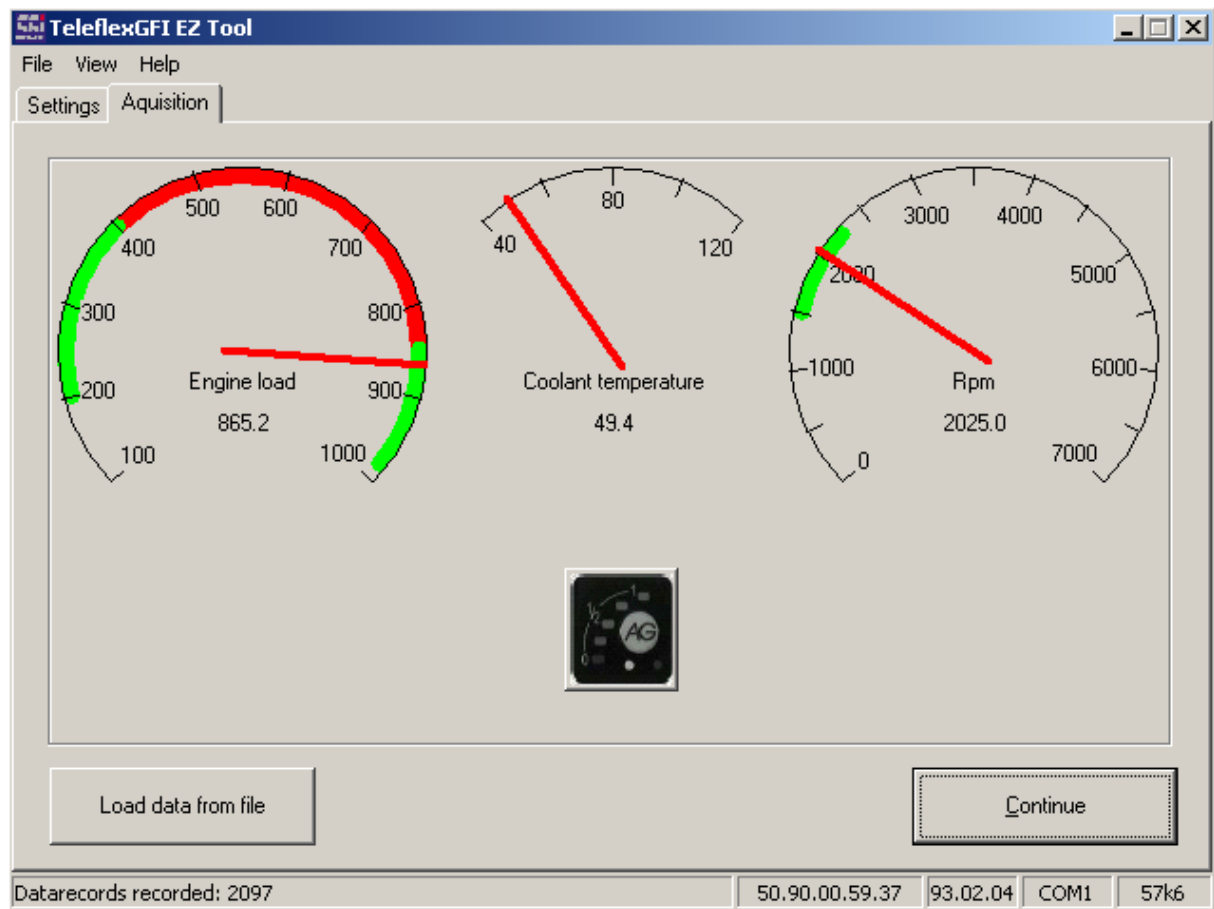
The EZ-SGI tool will let the car start automatically on petrol.

Check directly after starting the engine speed on the EZ Tool.

- If the engine speed gives the real RPM, continue.
- If the engine speed on the EZ Tool is not the same, stop the engine and:
  - The engine speed is not stable, go to “Solving Problems”.
  - The engine speed is double: select in the setting screen the option half sequential and try again.
  - The engine speed is half: select in the setting screen the option sequential and try again.
- If the engine speed is still wrong, go to the capital “Solving problems”, else continue.

**While you are making the calibration drive, it is important to follow-up the next instructions:**

- Try to drive the engine in closed loop. You can check the closed loop drive by use of an EOBD tester.
- Try to drive with a constant engine speed as possible in the green area of the engine RPM gauge on the EZ-SGI tool.
- The first part of the calibration drive on petrol:
  - Drive with the load alternately high and low in the green” Load area” of the engine-load gauge on the EZ-SGI tool.
  - Try to keep the load as constant as possible in a period of at least 10-15 seconds!
- Keep driving on petrol until the engine reaches working temperature after that switch over to LPG with the switch on the tool or on the dashboard.
- Drive the same cycles with a warm engine on LPG during 5 minutes. The drive constant periods should be 30-40 seconds.



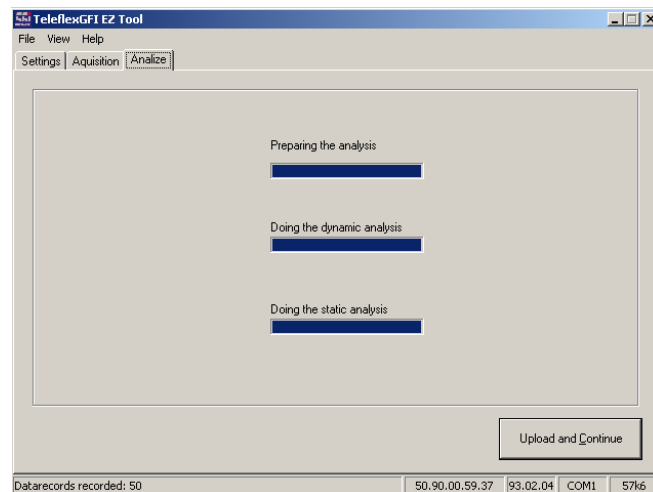
If during the calibration drive, through circumstances, the calibration must be stopped, than it is possible to load the created data, to finish the calibration. This is the last file in the indicated folder.

Stop the car, let the engine run on petrol or LPG, and click with the left mouse button on Continue (on the right, at the bottom of the screen).

## 7 Generating a Calibration

### Data Analysis

One by one the 3 bars belonging to, "Preparing the analysis", "Doing the dynamic analysis" and "Doing the static analysis" become blue. When all the bars are completely blue, click on Upload and Continue. The calibration will now be downloaded into the ECU.

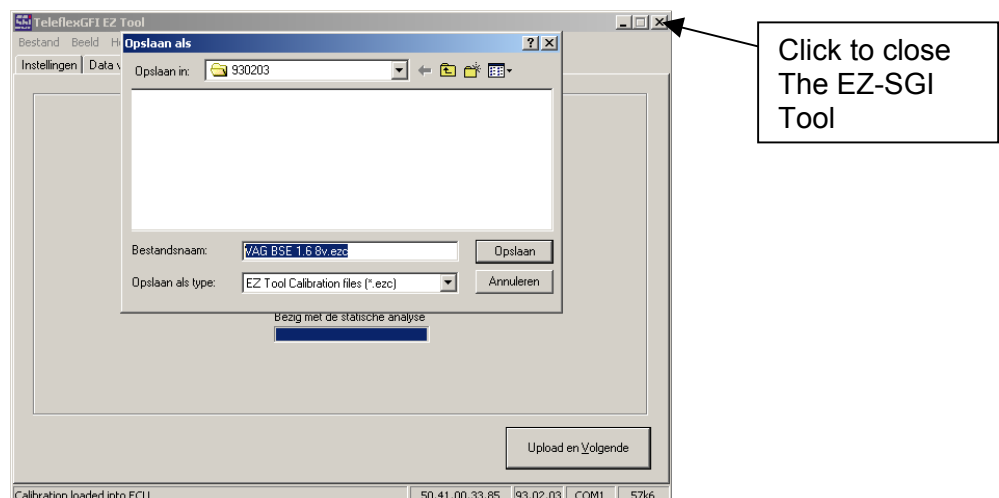


### Save as

After the calibration is send to the ECU you can save it. Click on "Save", so the program can save the file in the already selected folder.

### Closing the program:

Click with the left mouse button on the X at the right top corner to close the EZ-SGI tool.



## **8 Check created calibration**

After the completing of the calibration, you can check the calibration with help of an EOBD tester. Read out the long and short fuel trims during a ride on Petrol and LPG. The corrections may not differ more then 10%. See chapter solve problems as the difference is larger then 10%, or when other problems occur.

## **9 Solving Problems**

### **You received a message “too little data”:**

It is not possible to generate a calibration when you have not enough useful measurements. The EZ-SGI tool asks for more data. In this case you can continue with finishing the calibration and check the calibration. When the calibration is not ok, then contact the helpdesk.

### **Engine hesitates while driving on LPG:**

Move the connectors of the EZ-SGI injectors in order of the ignition in the following order

Disconnect EZ-SGI connector 1<sup>st</sup> cylinder of the wiring harness and connect to the 3<sup>rd</sup> cylinder.

Disconnect EZ-SGI connector 3<sup>rd</sup> cylinder of the wiring harness and connect to the 4<sup>th</sup> cylinder.

Disconnect EZ-SGI connector 4<sup>th</sup> cylinder of the wiring harness and connect to the 2<sup>nd</sup> cylinder.

Disconnect EZ-SGI connector 2<sup>nd</sup> cylinder of the wiring harness and connect to the 1<sup>st</sup> cylinder.

### **Jumping engine speed on the EZ-SGI Tool:**

If you find a jumping engine speed on the EZ-SGI Tool or the RPM is not the real RPM, it is not possible to make a calibration. Load the standard calibration from the calibration screen, and make test drive on LPG.

\* The car drives well with the standard calibration: load the calibration into the LPG ECU

The car does not drive well on the standard calibration:

Take the engine speed to 2000 RPM on petrol and LPG, without load and read out the petrol injection time (in ms) with a EOBD tester.

Put the car in the highest gear, and accelerate with a manifold pressure of 900 mbar from 60 to 80 km/h and read out the long and short fuel (in%). Do this on petrol and LPG.

Contact the TeleflexGFI helpdesk and inform them with these values.

You will receive a calibration by e-mail.

### **Different between learn values on petrol or LPG is more than 10%.**

You find a high difference between the learn values when the calibration drive on LPG puts the petrol system in open loop.

Check with an EOBD tester the closed or open loop during the calibration drive.

Solution:

Mixture is too lean: decrease the displacement value with 400 cc steps.

Mixture is too rich: increase the displacement value with 400 cc steps.

**Note**