

Pegasus Fuel Injection

E-Z Setup

www.performancefi.com

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Introduction

Welcome to the PFI, Pegasus Fuel Injection, E-Z software setup document. This is the quickest way to get your PFI system up and running. Assuming you have already:

- Installed PFI mechanical on your motorcycle and read the hardware installation guide
- Verified the system functions properly, and checked all wiring twice
- Checked the fuel system for leaks and bled it properly
- Started the motorcycle
- Installed Pegasus60 on your computer

Then, you're ready to communicate with your bike. Begin by selecting the "Pegasus60" ion on your computer screen:

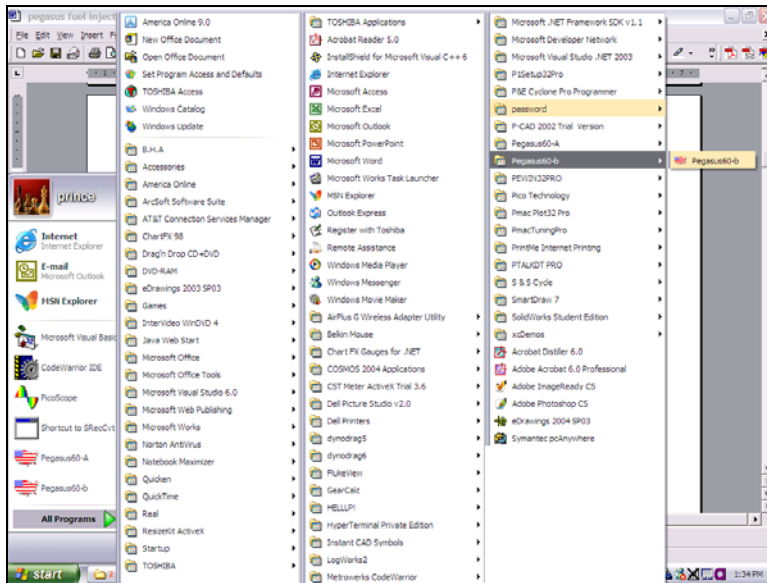


Figure 1. Screen capture showing how to select Pegasus60. System comes with version "B."

Opening the Com Port

Begin by picking the correct serial communications port on your computer. Most PCs and many older laptops have serial communications ports, however newer ones may not. If the provided interface cable does not fit into any 9 pin port on your computer, you don't have a serial port; you will need to get a "usb to serial" adapter cable. See our website or call tech support for more details.

- Computers with serial port: Choose com1 or com2 (you need to know which port you're connected to), then **open com port.**

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- Computers with serial to usb adapter: choose the port that corresponds to the correct usb slot. This is usually com4 or above (again, you need to know which port you're connect to). Then open com port.
- Com3 is reserved for computers without a com port, and can be used to explore the software. You cannot send or get anything from the ECU in this mode.

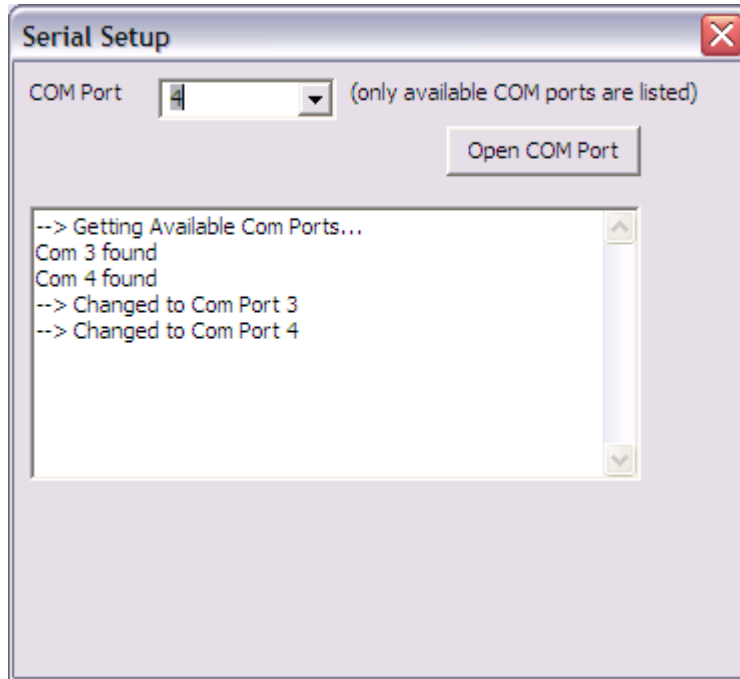


Figure 2. Serial setup screen. Select the correct com port, then click the "open com port" button.

Get Contents From ECU

Connect the supplied cable into the hole in the back of the ECU and to your computer serial port. Turn on the ECU. After 2 seconds you should see the following screen (if you don't, there is a problem with the com port):

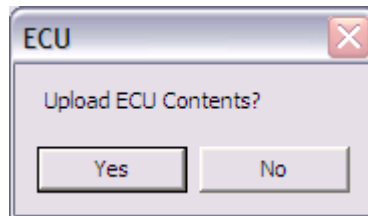
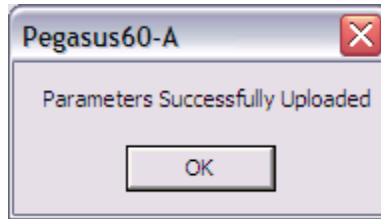


Figure 3. Message box asking about getting contents of ECU memory. Always begin session be selecting "yes."

- Click the "yes" button to get all the ECU contents and load them into the computer.

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- After a short time, you will see the “parameters successfully uploaded” message. This means communication has been established and all parameters are now in the PC.
- A series of message boxes will follow. Select “ok” for each box until all map files have been successfully uploaded from the ECU to the PC. Some versions may have up to 6 map files.

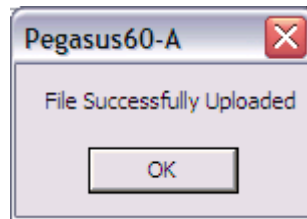


Figure 4. Message box indicating a map file has been uploaded from the ECU to the PC. Always click the "ok" button to proceed.

- You should now see the main screen, as shown in figure 5. If you don't see the fuel map, click on the “fuel” button.
- Assuming you see a similar fuel map, click on the “parameter” button to view parameters.

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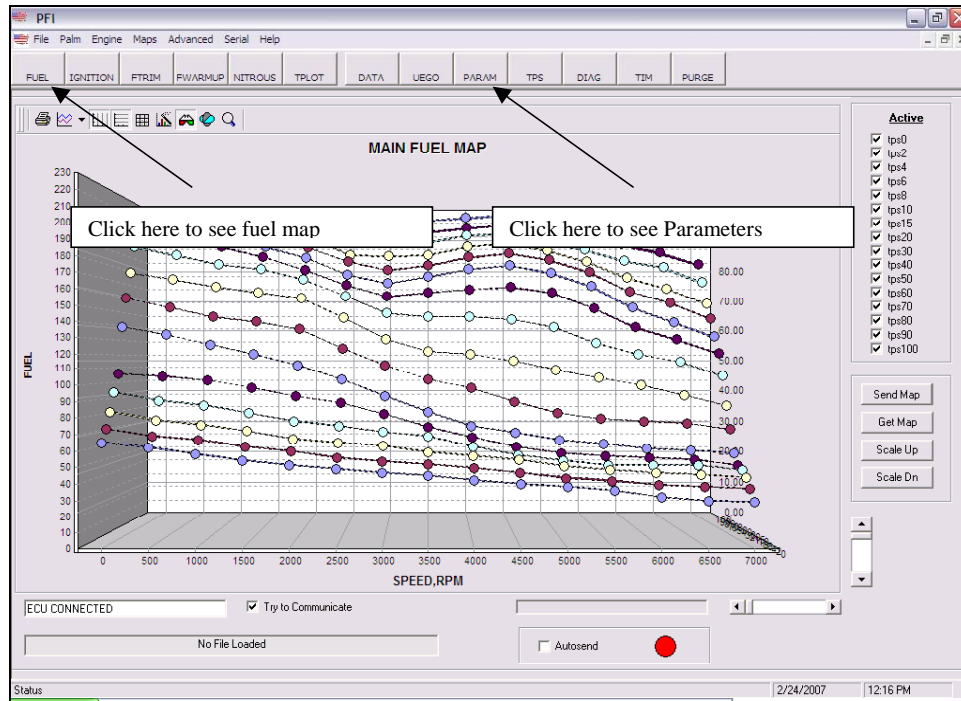


Figure 5. Main screen showing typical fuel map.

Brief Overview of the Interface Software

- Pegasus60 is intended as a simple interface and allows you to configure your ECU for your engine. Although extremely powerful, only a few changes need to be made to get you on the road.
- You can view different screens and menus without worrying about changing the contents of the ECU. You can, at any time, save any changes you make to a file on your PC.
- You can navigate throughout the entire map file. Changes won't take effect to any map in the ECU unless you are in "autosend" mode, or unless you click a "send" button. Parameters only change in the ECU when you click the send button as well.
- The top menu names activate "drop down" menus that have more advanced features. For the E-Z installation, you don't need to activate any of these menus.
- The square buttons above the map activate different maps/screens as well as other important forms.
- The connection box in the lower left hand part of the screen tells you if you are connected to the ECU. If you see a "yellow" box, the ECU is not communicating with the PC. This occurs when the power is off, or the communication cable is not connected, or the comm port is incorrect.

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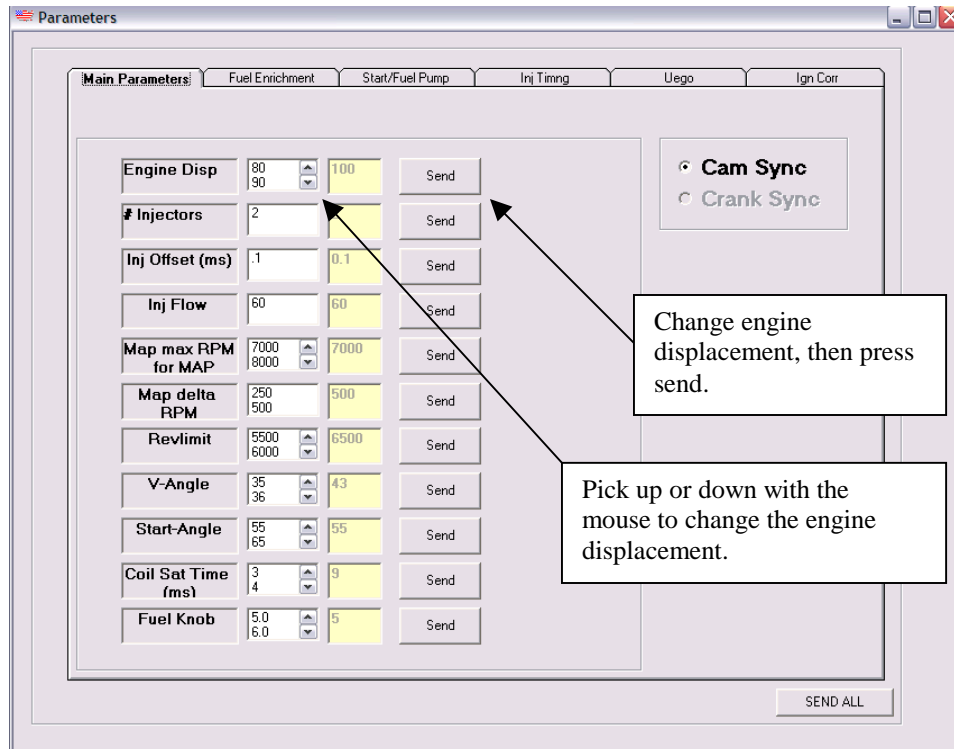


Figure 6. Parameters screen. Always begin by selecting the "main parameters" folder tab to view the most important parameters.

Setting the Engine Displacement Parameter

- In the E-Z start mode, you only have to change one (engine displacement) parameter to get started.
- Change the “engine disp” parameter to your engine displacement by clicking up or down on the listbox arrow, then click on the displacement. You will see the displacement textbox change automatically. Always round to the closest displacement (i.e. 113 ci = 110).
- Click the “send” button closest to engine displacement to send the parameter.
- You don’t have to worry about changing any other parameter or any map value at this time. Your motorcycle should start and run with this change.

Ready to Start

That’s all there is to the E-Z start!!

- Unplug cable from ECU.
- Turn off power.
- After 5 seconds, turn power on, wait until pump stops.
- Turn throttle to 45 degrees to “prime” engine, for 2 seconds, then back to 0 degrees.

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- Turn choke knob to top of ECU to desired setting.
- Turn throttle to approximately 10 degrees.
- Press starter button until engine starts.
- Work throttle for 60 seconds.
- Let idle until warm, then ride like hell!!

Other Important Items

After getting your system up and running, it is important to (1) set the idle (2) set cruising conditions. The idle adjustment is easy because it can be done while the bike is stationary, but cruise must be done over-the-road. PFI systems usually run well at wide open throttle with the default map, but you can change just about ANYTHING with PFICOMM. For more information on the interface software, please use the complete [“Installation and Software Guide.”](#)

How to set the idle

Refer to figure 9 in the appendix for parameter description and illustration. Because of the inherent power pulsing of the V-twin, PFI uses an “idling” mode to reduce speed variations. The idle mode does not use any of the maps; instead it uses a series of parameters to control the fuel and ignition when (1) the throttle is lower than a throttle idle threshold (2) the engine RPM is lower than an RPM idle threshold. If these two conditions are true, the ECU will be in idle mode, and holds the fuel and ignition fixed until you leave the idle mode. This makes idling very stable.

It is also important to set the idle speed to approximately 1000 RPM using the idle adjustment screw on the side of the throttle body. This is accomplished by using an “Allen” style wrench to turn the idle screw.

You can use the Data form to view all important engine data real time. This is accomplished by clicking on the “data” button on the menu, then selecting the “getdata” checkbox. This will help you determine the current RPM and TPS.

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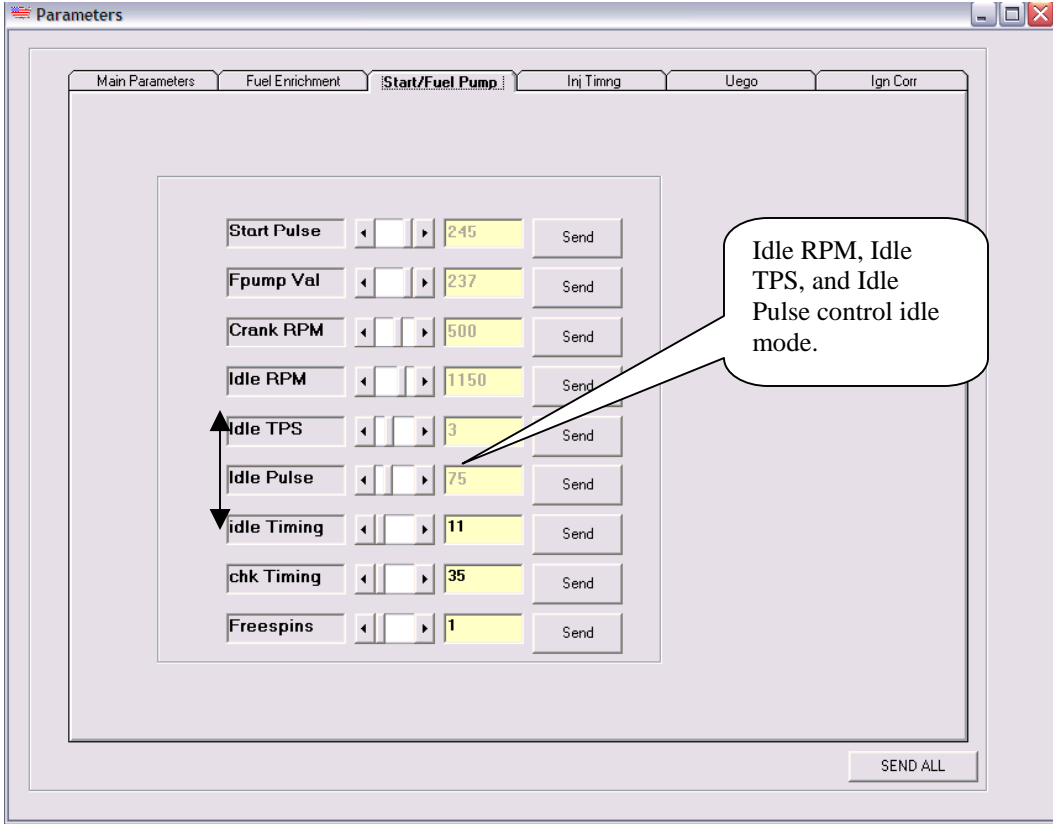


Figure 7. Important idle parameters.

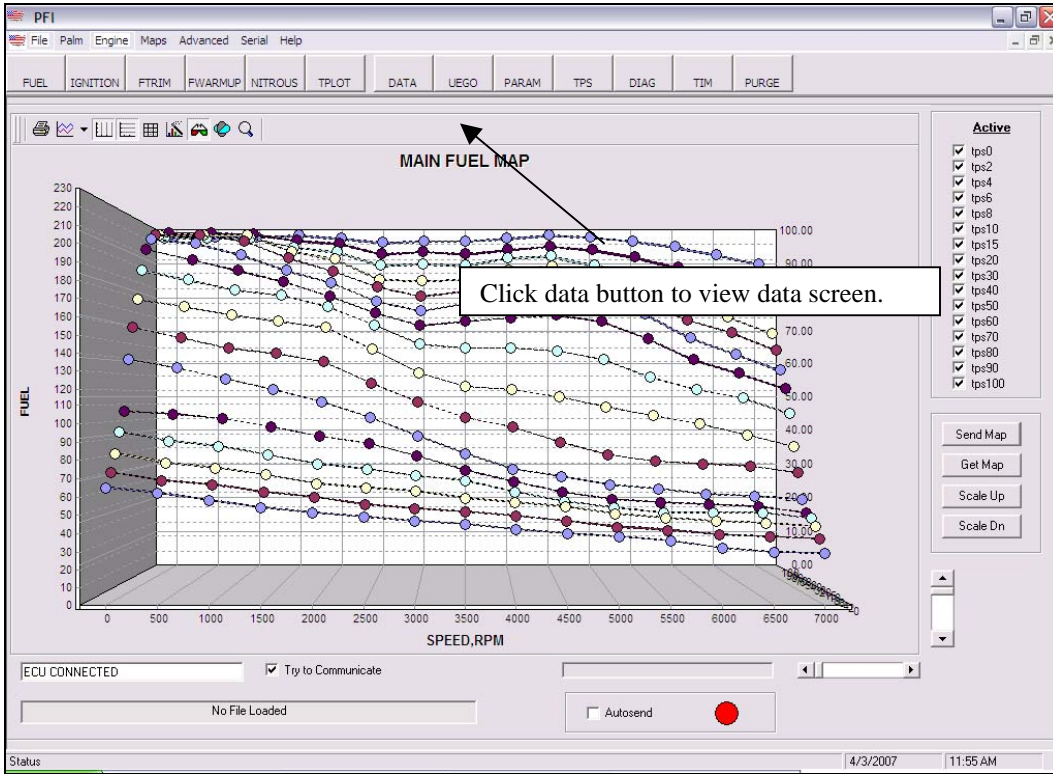


Figure 8. Select the "data" button to view the data screen.

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- Begin by starting the engine, warming up, then allowing to idle.
- Go to the “parameters” screen and note the **idle TPS** and **idle RPM**. These two parameters determine when you are in idle mode and are set at the factory to 3 degrees and 1150 RPM, respectively. Make note of these settings. Now close the parameters screen.
- Use the “data” screen to view all data. Press the “get data” checkmark to begin data acquisition.
- You will be able to see your current throttle position and engine RPM. Shoot for 1000 RPM (average).
- Use the Allen wrench to adjust the idle to 1000 RPM. Note the throttle and RPM.
- If the current throttle position is above 3 degrees, you must go back to the parameters screen and change the “idle TPS” parameter to 1 degree above the current throttle position.

Example: After starting the engine and warming it up, the data screen shows the engine idling at 800 RPM at 2.5 degrees of throttle. The idle TPS parameter is set at 3 degrees and the idle RPM parameter is set at 1150 RPM. It looks like it will take a degree or two of throttle to make the engine idle at 1000 RPM.

Begin by changing the idle TPS parameter to 5 degrees to make sure you will stay in the idle mode while making these changes. Click on the slider arrow until the text box reads 5 degrees, then click “send.”

Now go back to the data screen. Click get data and observe the RPM, which should still be at 800. Using the Allen wrench, increase the idle to 1000. Make sure the throttle position is still below the 5 degree limit. Now reset the idle TPS parameter to 1 degree above the current throttle position. You may have to adjust the idle pulse to richen on lean out the idle mixture.

This concludes the idle example.

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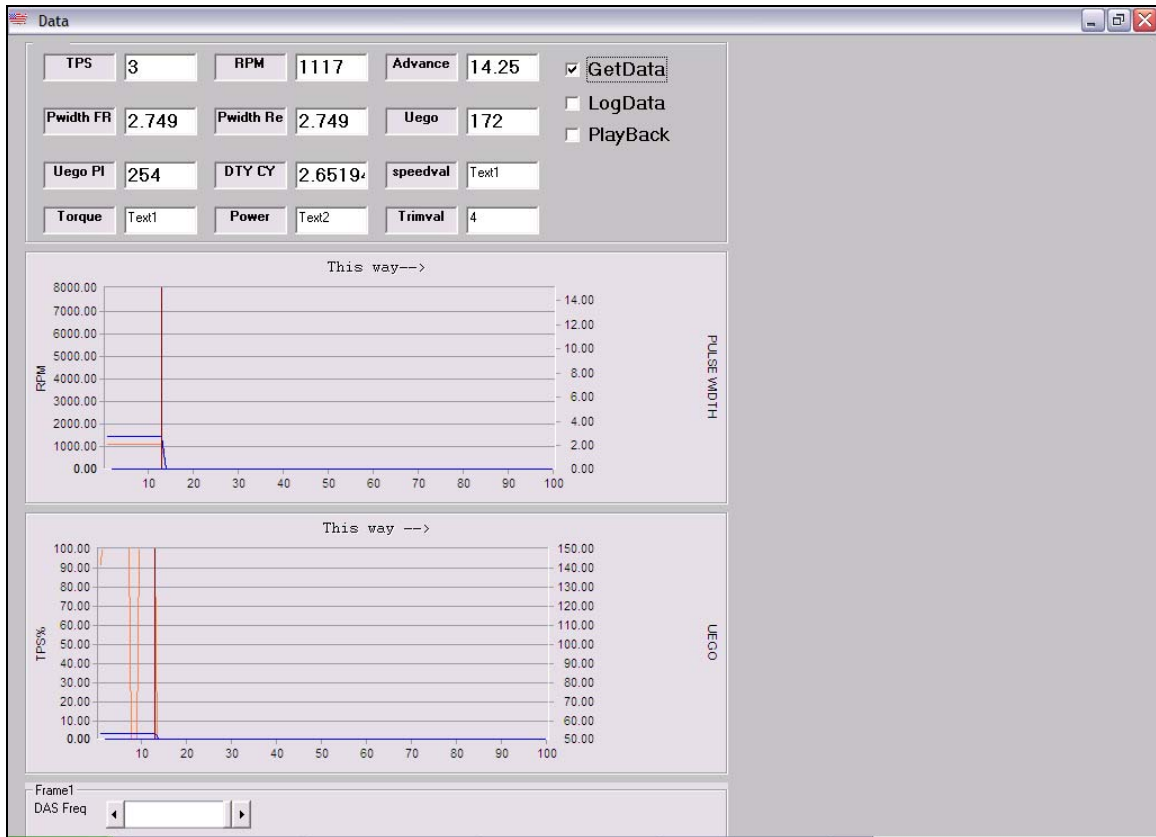


Figure 9. Data screen. This engine is idling at 1117 RPM, with 3 degrees of throttle.

Appendix

Detailed Description of Parameters

Note: Pegasus60-b does not let the user have access to all parameters and maps. For all features, use Pegasus-A.

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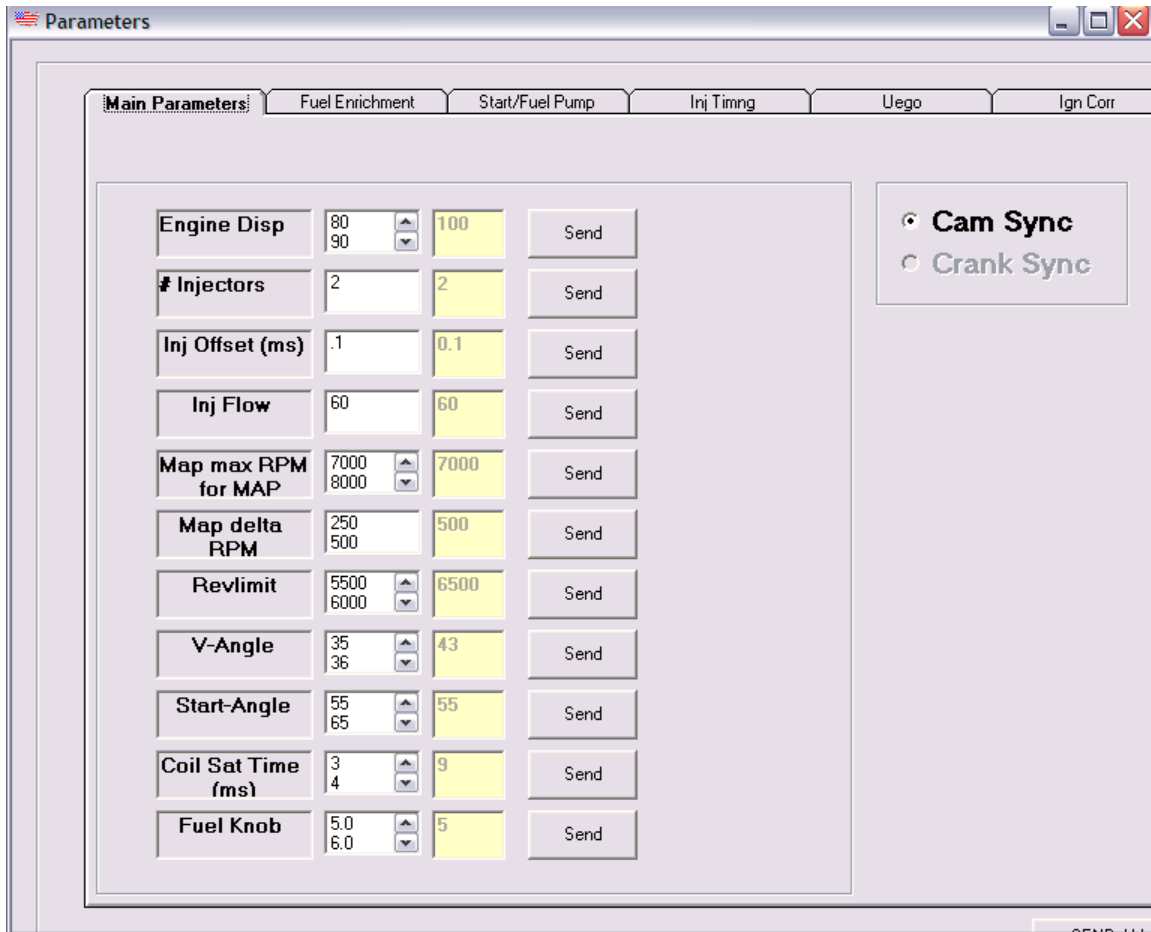


Figure 10. Main Parameters.

Main Parameters

1. Engine Disp-Engine Displacement. Properly scales fuel injection information for your engine displacement. Set to engine displacement.
2. # Injectors-Number of injectors. Cannot be changed in “B” version, and is set to 2.
3. Injector Offset-Fuel injector pulse width offset. Cannot be changed in “B” version and is set to .1
4. Inj Flow-Injector flow rate, in lbm/hr. Cannot be changed in “B” version and is set to 60.
5. Map max RPM-Maximum RPM for all maps. Normally set to 7000, but can be changed for high RPM applications. Note: see website for further details.
6. Map Delta RPM-RPM increment for all maps. Normally set to 500, but can be changed for certain applications. Do not change unless you have consulted PFI.
7. Revlimit-Revlimit, in RPM. Normally set to 4000 RPM for break-in, then changed to 6500.

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8. V-angle-Angle between cylinders. Normally set to 45 degrees, although changing this parameter can sometimes increase horsepower.
9. Coil Sat Time-Coil saturation time, in milliseconds. Determines how long the coil is to be saturated. Normally set to 9 msec for 3 ohm coils.
10. Fuel knob-Fuel knob increment, in %. Determines the percent increase in fuel when the ECU knob is turned (5% increments is normal). Only effects fuel percent increase from nominal position. Fuel decrease is always set at 2%.

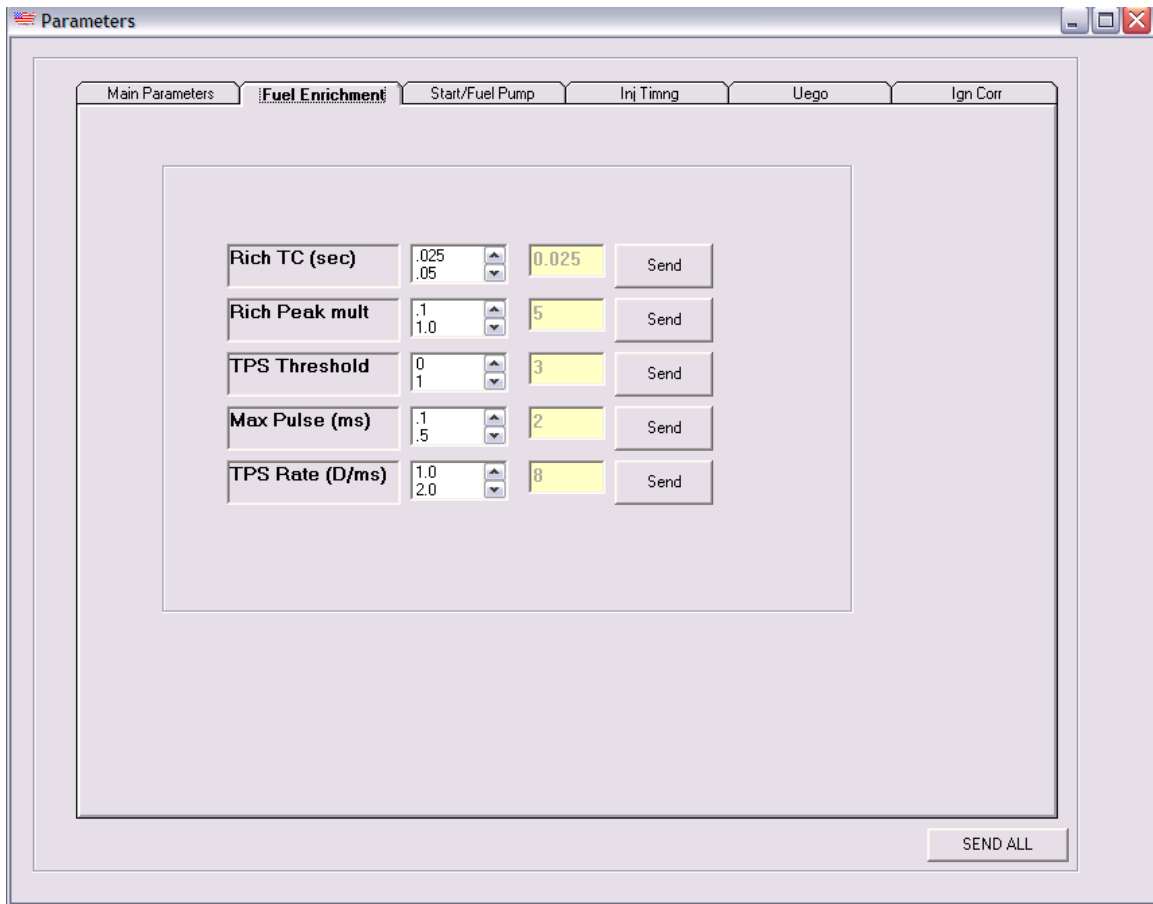


Figure 11. Fuel Enrichment parameters.

Fuel Enrichment

1. Rich TC-rich time constant. Determines how long enrichment lasts. Best to leave at .025 seconds.
2. Rich Peak Mult-Rich peak multiplier. Determines volume of fuel to be injected during a transient. Best to leave at 5.

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3. TPS threshold-throttle position threshold for fuel enrichment. Set just above idle TPS to ensure enrichment won't occur during idling. Idling usually occurs at 1-2.5 degrees of throttle; leave at 3 degrees for most applications.
4. Max Pulse-Maximum fuel pulse, in milliseconds. Most applications need less than 5 milliseconds.
5. TPS Rate-Throttle position rate, in degrees per millisecond. Rate below which enrichment won't occur. Best left at 8.

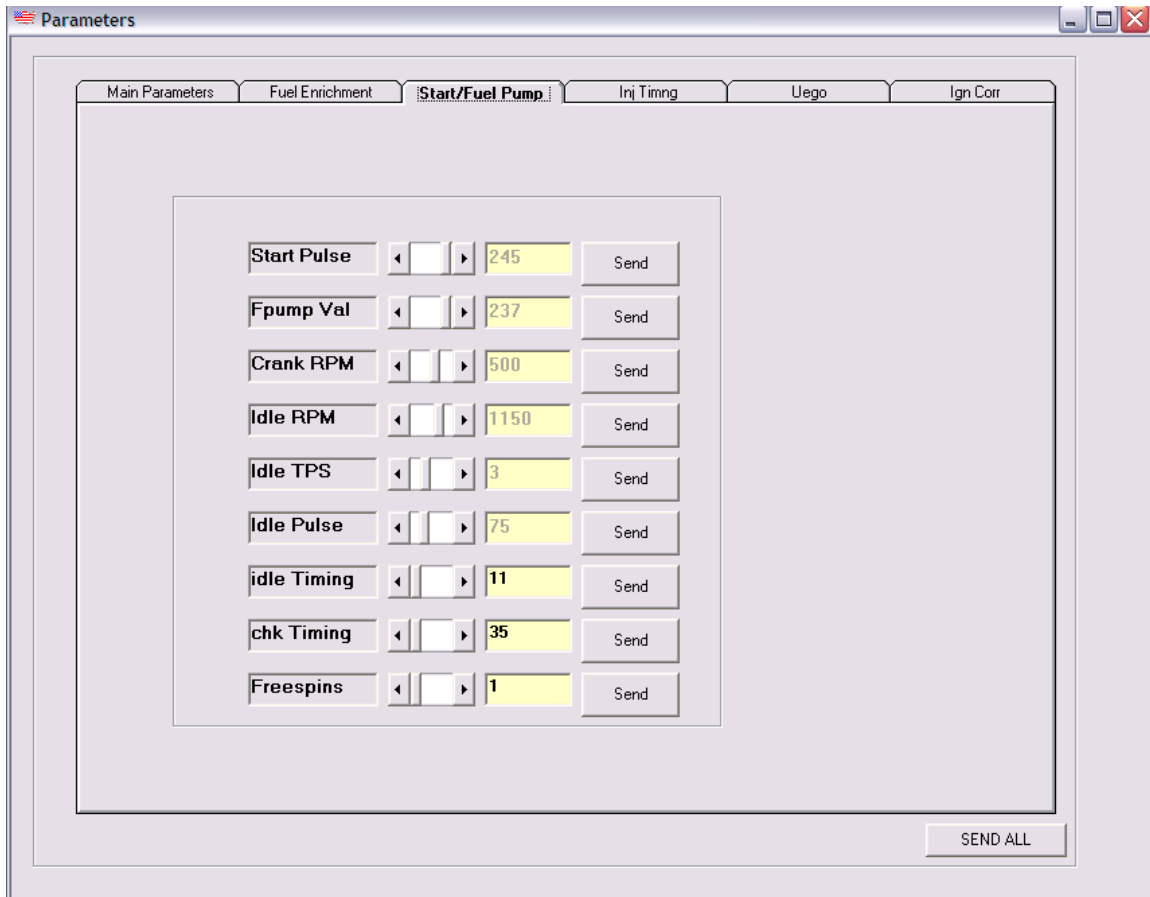


Figure 12. Start/Fuel Pump parameters.

Start/Fuel Pump

1. Start Pulse-Starting fuel pulse value. Leave at 245 for most applications.
2. Fpump Val-Fuel pump value. Determines duty cycle for fuel pump. Set above 200 for most applications. Note: for engines above 150 ci, set to 250, and use a high flow filter.
3. Crank RPM-Cranking RPM. Set above cranking RPM to force into crank mode. Set to 500 for most applications.

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- Idle RPM-Idle RPM at which engine enters idle mode. Set to 200 RPM above actual desired idle speed (1200 is normal).
- Idle TPS-Idle TPS at which engine enters idle mode. Set to 1 degree above actual recorded idle TPS. Note: engine will enter idle mode and use idle pulse when engine is below both idle TPS and RPM (4 degrees is normal).
- Idle Pulse-Idle fuel Pulse value. When engine is in idle mode, fuel pulse is constant at set to idle value. Depends on engine displacement and should only be adjusted when engine is hot. Very important to adjust this parameter to make engine idle correctly.
- Idle Timing- Idle timing, in degrees. When engine is in idle mode, ignition timing is constant and set to idle value. Normally set to 11 degrees.
- Chk timing-Choke timing, in degrees. When knob on ECU is set to position 9 (choke position), engine enters choke mode and uses choke timing. Usually set to 35 degrees to increase RPM during warmup.
- Freespins-Number of cam revolutions engine must turn before firing ignition. Best to set to at least 1 revolution. Note: freespins only applies after key on power is applied.

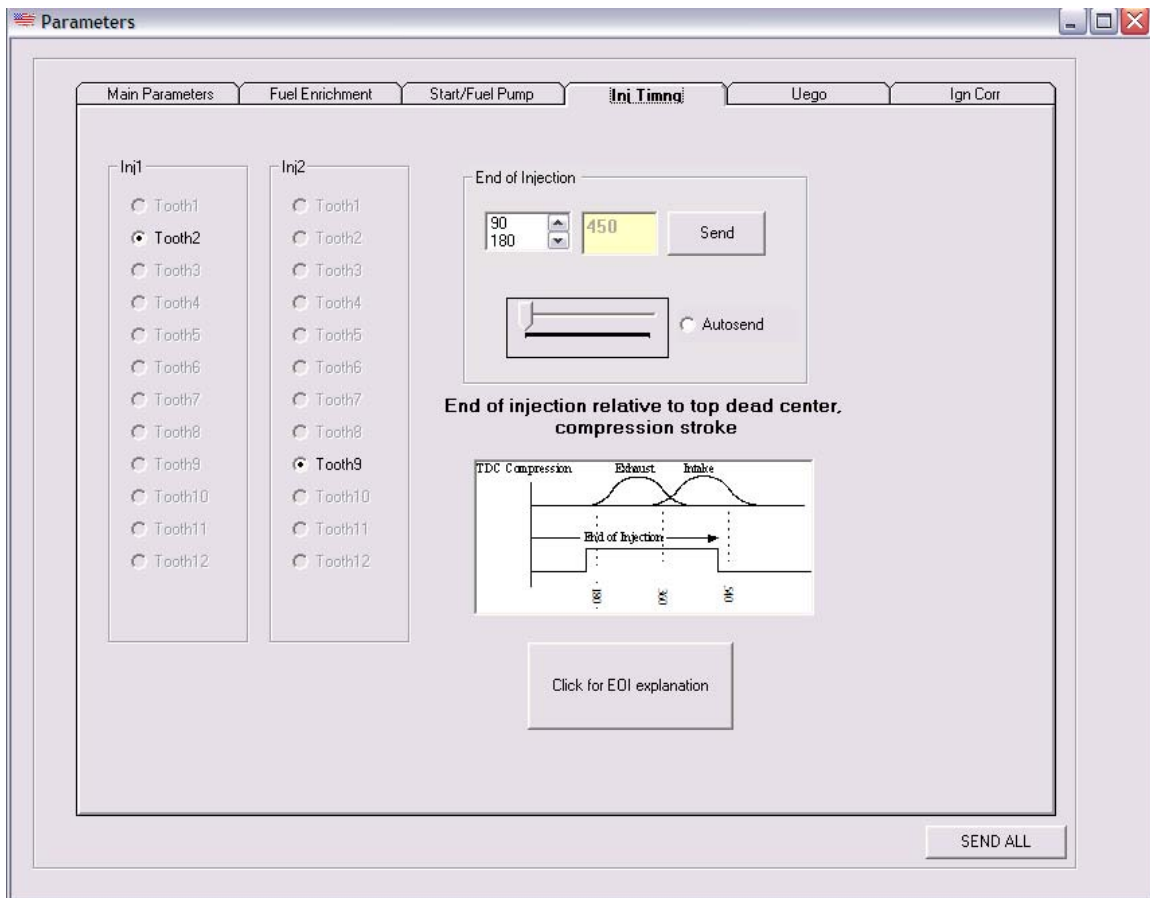


Figure 13. Injector timing parameters.

Injector Timing

1. Inj Timing-Injector timing in degrees after TDC on compression stroke. 360 would be TDC on exhaust stroke. Usually set to 450, or ½ down on intake stroke. Note: click on explanation button for more information. Note: Scroll bar will send this parameter in 1 degree increments when autosend is activated.

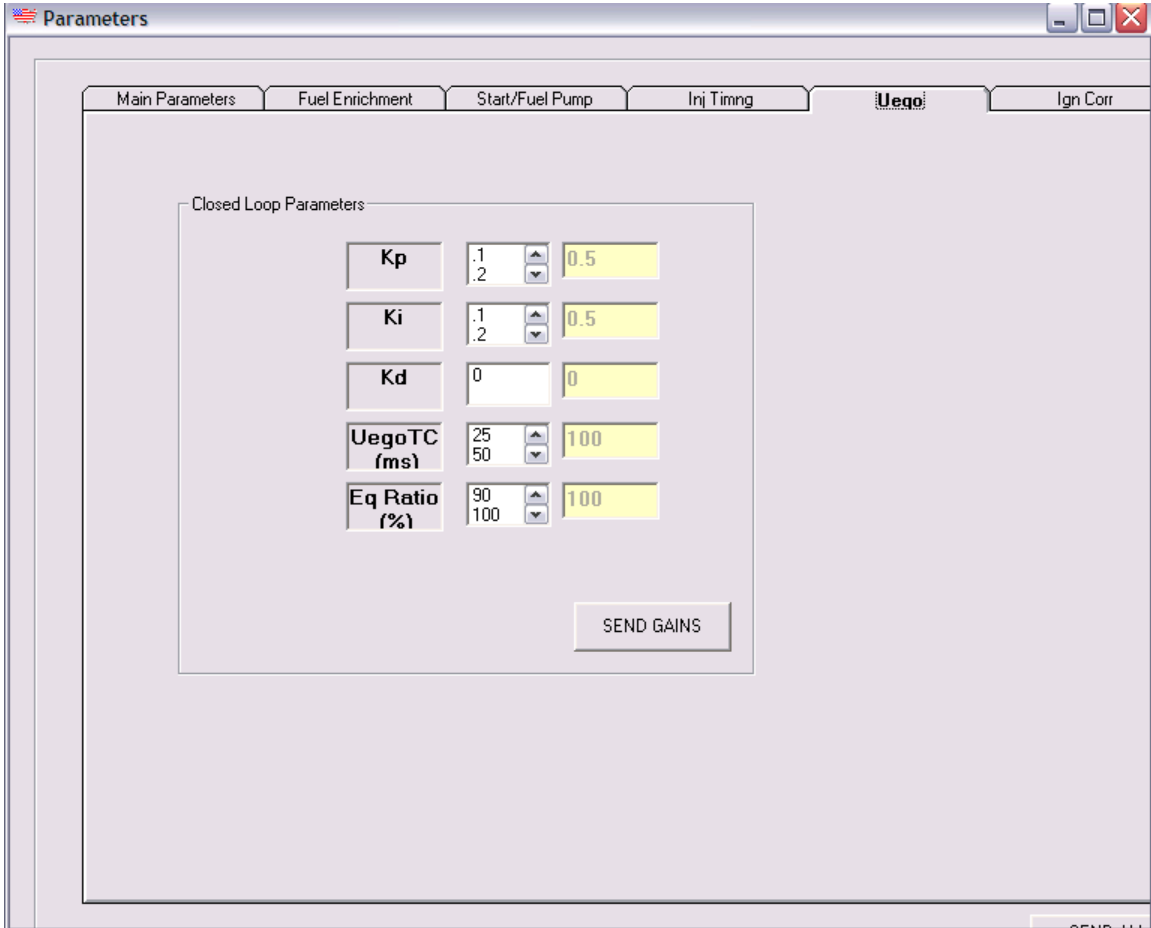


Figure 14. Exhaust gas oxygen sensor feedback parameters.

Closed loop Wide Band

Note: PFI can be used to create maps in the closed loop mode, but runs open loop over-the-road. See UEGO document for more details.

1. Kp-Closed loop proportional gain. Set to .5
2. Ki-Closed loop integral gain. Set to .5
3. Kd-Closed loop derivative gain. Always set to 0.
4. Uego TC-wide band sensor time constant. Used to filter out noise due to pressure reversions in exhaust pipe. Set to 100 (milliseconds)

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- Eq Ratio-Equivalence ratio. See UEGO document for more details. Set to 100 for max power, 90 for normal drive.

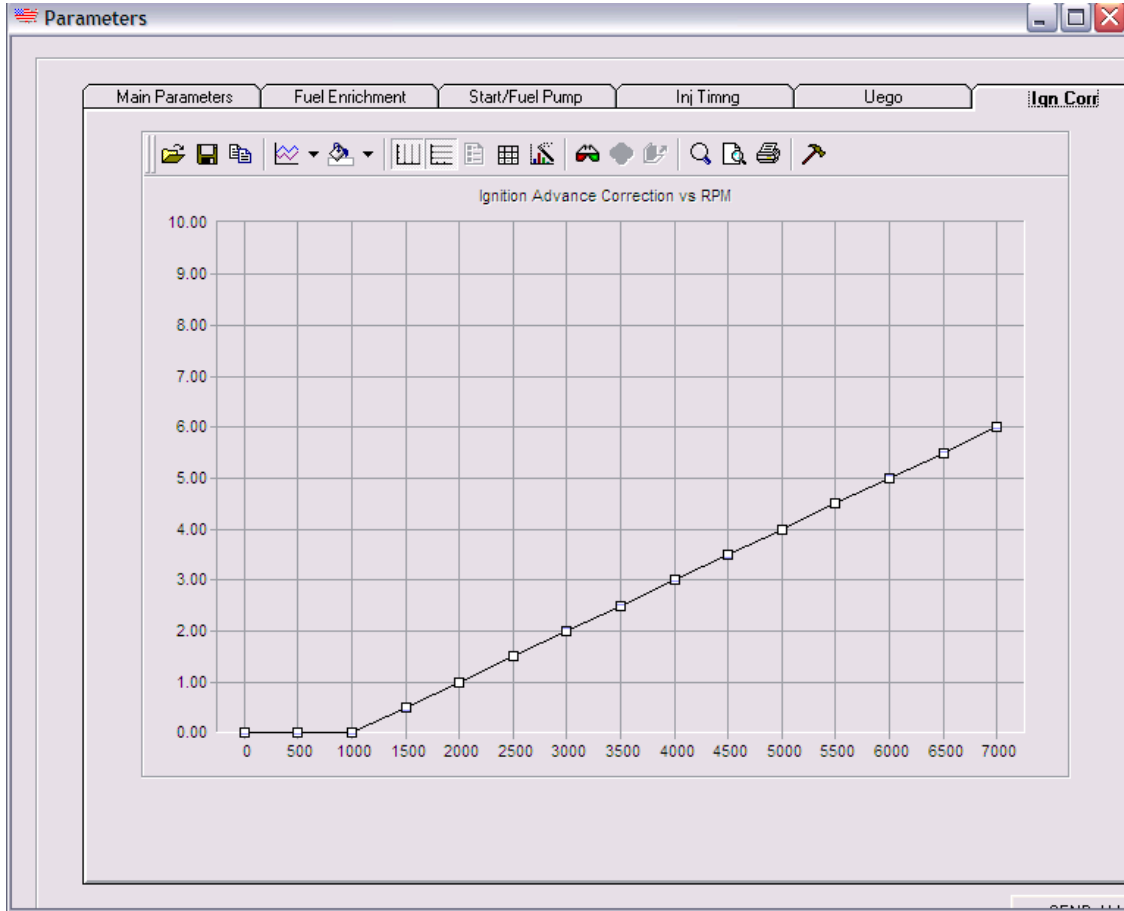


Figure 15. Ignition correction map.

Ignition Correction

Note: Ignition correction set by factory and doesn't need to be adjusted. This correction map is used to correct for different ignition pickup sensors. May be adjusted if different position sensor used, or if max RPM changed above 7000. See PFI website or consult tech support for more information.