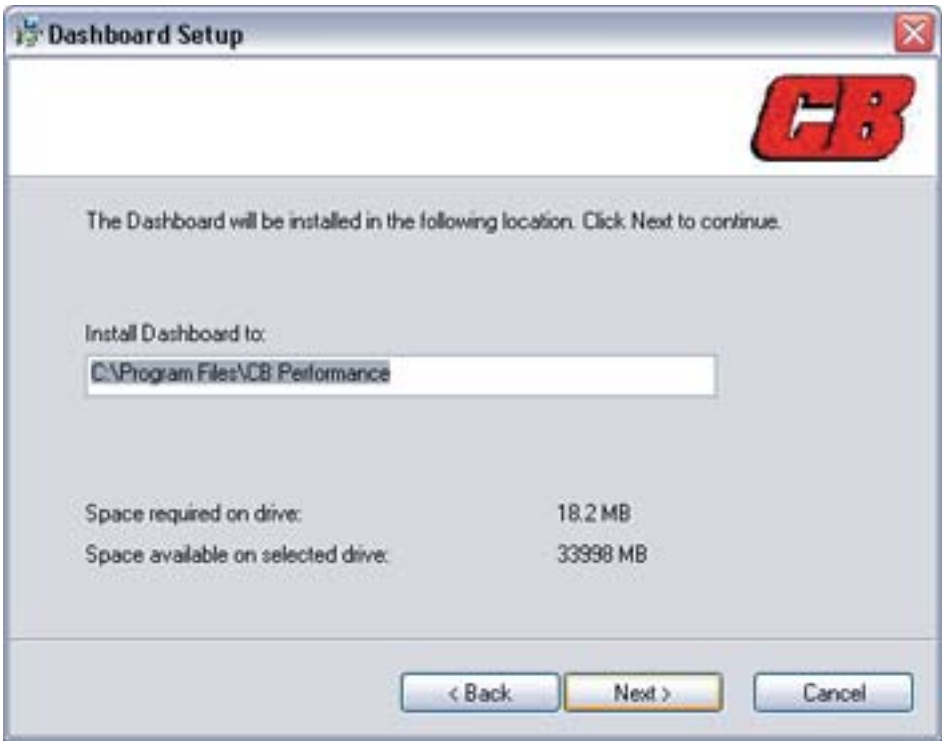
QUICK TUNE EFI INSTRUCTION MANUAL

Step 1: Loading the CB quick Tune Software to your PC

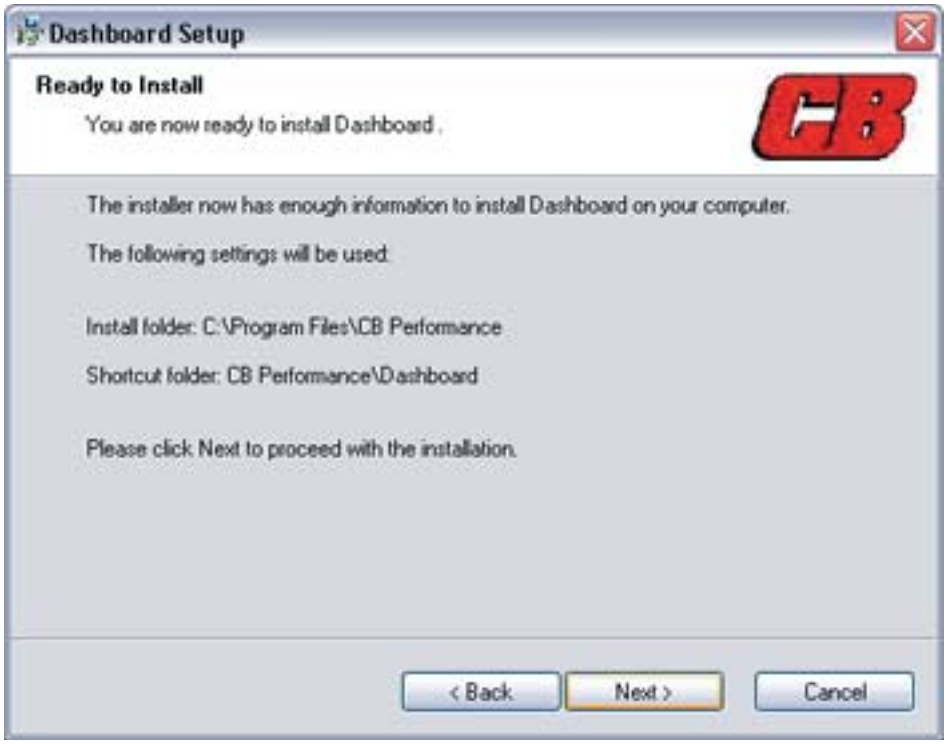
A) Take the CB Quick Tune installation CD and load it into your PC. A window will pop up asking to have all programs closed on your PC prior to installing the software. After closing all open programs, click "next" to continue

B) A window will pop up with a "End User License Agreement". You will need to accept the conditions by left click on "I agree to the terms of this agreement" to continue. After agreeing to the terms, left click "Next"

C) A window will pop up showing where the Dashboard software will be installed. Left click "Next" to continue.



D) A window will pop up saying the software is "Ready to be installed". Left click "next" to continue.

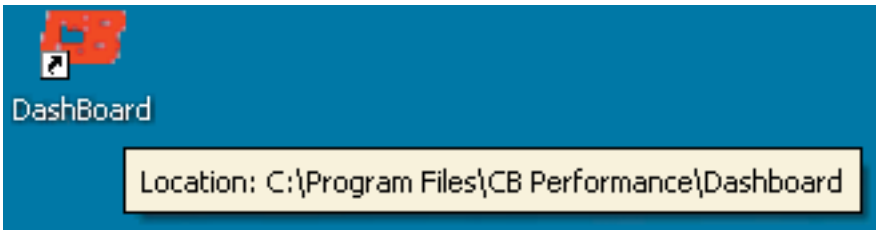


E) One final window will pop up saying "Installation Complete" Left click "Finish" and your CB Quick tune dashboard is installed.

Step 2: Opening the CB Quick Tune EFI DashBoard

A) Make sure your PC is connected to the EMS and the key is in the on position of your vehicle.

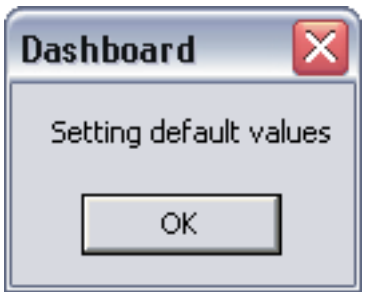
B) Locate the CB icon on the desk top of your PC and double left click on it. This will open the DashBoard.



NOTE

You are able to work offline from the EMS. You have limited use of the Dash Board while working offline.

C) A window will pop up saying "Setting Default Values". Left click OK to continue.
This window will not reappear unless you load the CB Quick Tune software into another PC.



Step 3: Using your CB Quick Tune EFI Software

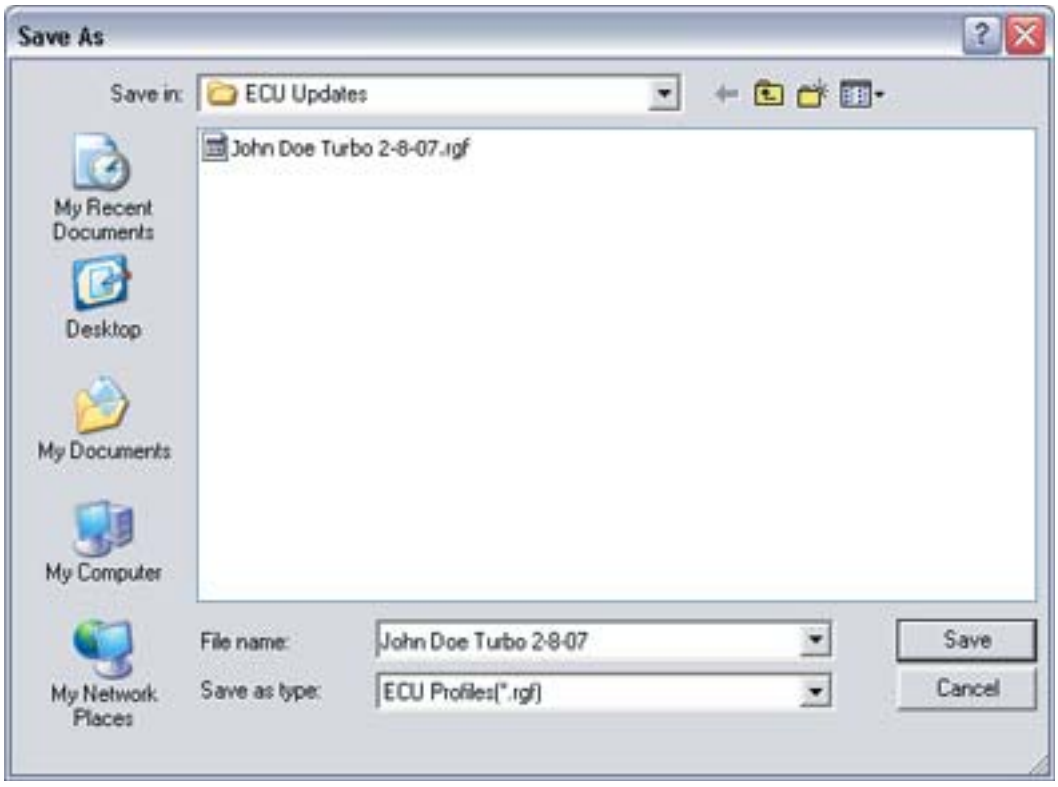
A) A profile was programmed into your EMS by a CB EFI Tech before shipment of your kit. You should save this profile before starting your vehicle. Having this original profile saved will allow you to retrieve it at later times. The following steps will instruct you how to do this.

B) Close the "Set Up" window in the dash board and left click on "Update" at the top of the dash board.

C) Left click on "Save profile From EMS". You will be instructed that your car will shut down, Left click OK. You will need to give your profile a name.

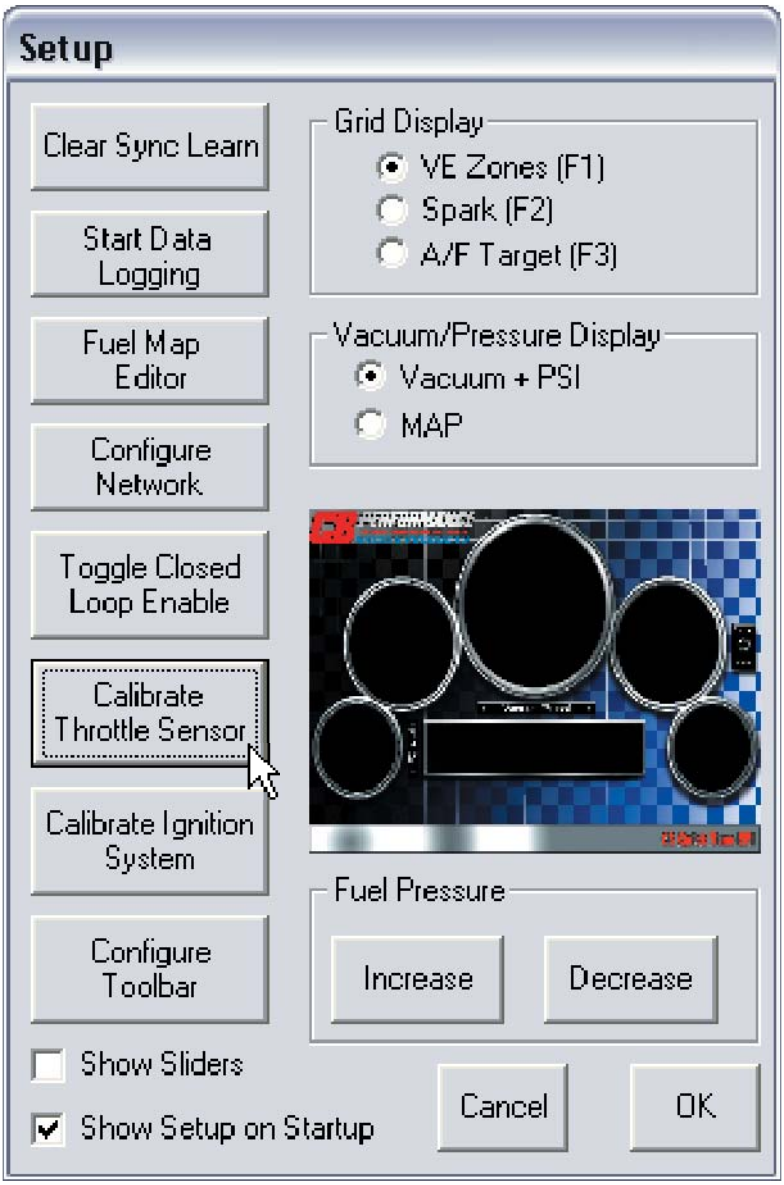
NOTE

It is a good idea to give your original profile a date after the name you select. (For Example - John Doe Turbo 2-8-07)

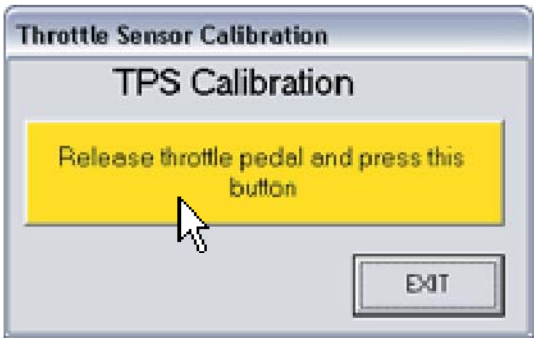


After naming your original profile, left click "Save". Your original file has now been saved for future use, if desired.

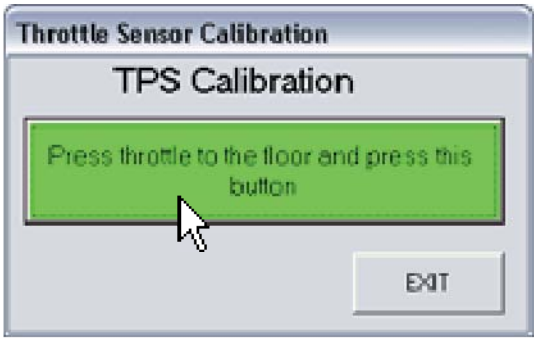
D) Next you will need to open the Setup window of the dash board. After you open the set up window, left click on "Calibrate Throttle Position Sensor".



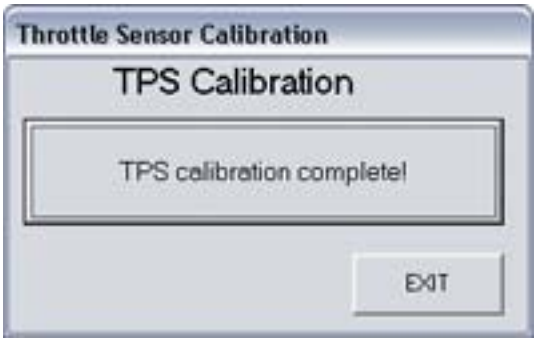
1) Release the pedal and click on the yellow box.



2) You will now be informed to depress the throttle pedal and click on the green box.



3) Wait a few seconds and the green calibration box will say "Calibration Complete." Your throttle position sensor is now calibrated.

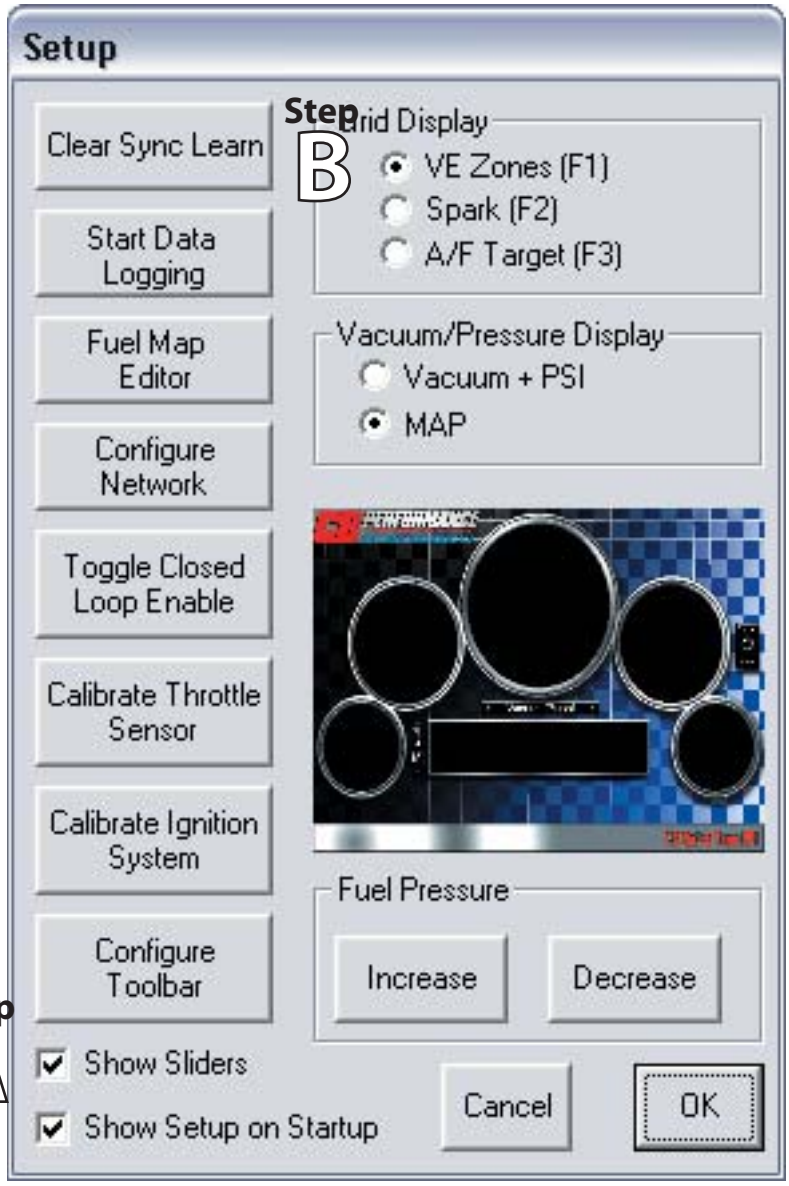


Step 4: Starting Your Car For The First Time

A) In the Setup window of the dash board, left click on "Show Sliders" Doing this will show the acceleration and cold start sliders on start up of the dash board.

B) Next, left click on "VE Zones" in the Setup window under Grid Display. Click OK to close out the set up window.

C) Your VE Zone grid display is divided into 33 zones. One of which is the idle Zone and the other 32 are driving zones.



VE ZONE		IDLE	-5.2			IDLE AC	0	
	-25 to -7	-7 to -4	-4 to -1	-1 to 2	2 to 5	5 to 8	8 to 11	11 to 17
0-2000	2	3	8	0	0	0	0	0
2001-2900	-0.4	5.5	17.8	0	0	0	0	0
2901-4100	-5	5.7	-1.2	2.2	0	0	0	0
4101-7500	0.1	0	0	2	5	2	0	0

D) Start your vehicle. Pay close attention to the air fuel ratio gauge in the dash board. Under cold start conditions your air fuel ratio should be in the 11.5-1 to 12.5-1 air fuel ratio's If your engine idles above 13-1 or below 11-1 air fuel ratio, you can left click on the Cold start slider. Using your arrow keys on your PC, click to move the slider in the direction needed to achieve a correct cold start air fuel ratio.

E) In your CB Quick tune EFI Kit, the EMS controls your fuel pump. This feature will monitor the fuel pressure, keeping it at 45 psi. There is no need for a fuel pressure regulator or return line.

F) If your kit is fuel only, "This means you are not controlling the timing through the EMS" you are now OK to drive your car. If you are running fuel and spark you will need to refer to the "Calibrating Ignition System" area of this manual before driving your vehicle.

G) You will notice after start up when the engine reaches 150 degrees head temp, that the EMS will begin to "Learn" or "adapt" to your engine and driving style. The VE zones in the dashboard will start to fill in with values. Negative values reflect that the EMS is pulling out fuel in that zone. Positive values reflect that the EMS is adding fuel in that zone. Each number represents 1 percent. A value of -12 represents -12 percent of fuel is being pulled out in that particular zone. Seeing zones in the 15-25 percent range is OK. When zones start climbing or dipping into the 30 percent range you need to consider trying another profile.

H) If you have Zones in the 30 percent range, you can apply your VE correction to your original profile you saved before start up.

Applying VE Correction

A) The first step to applying VE correction is to open your original profile you saved.

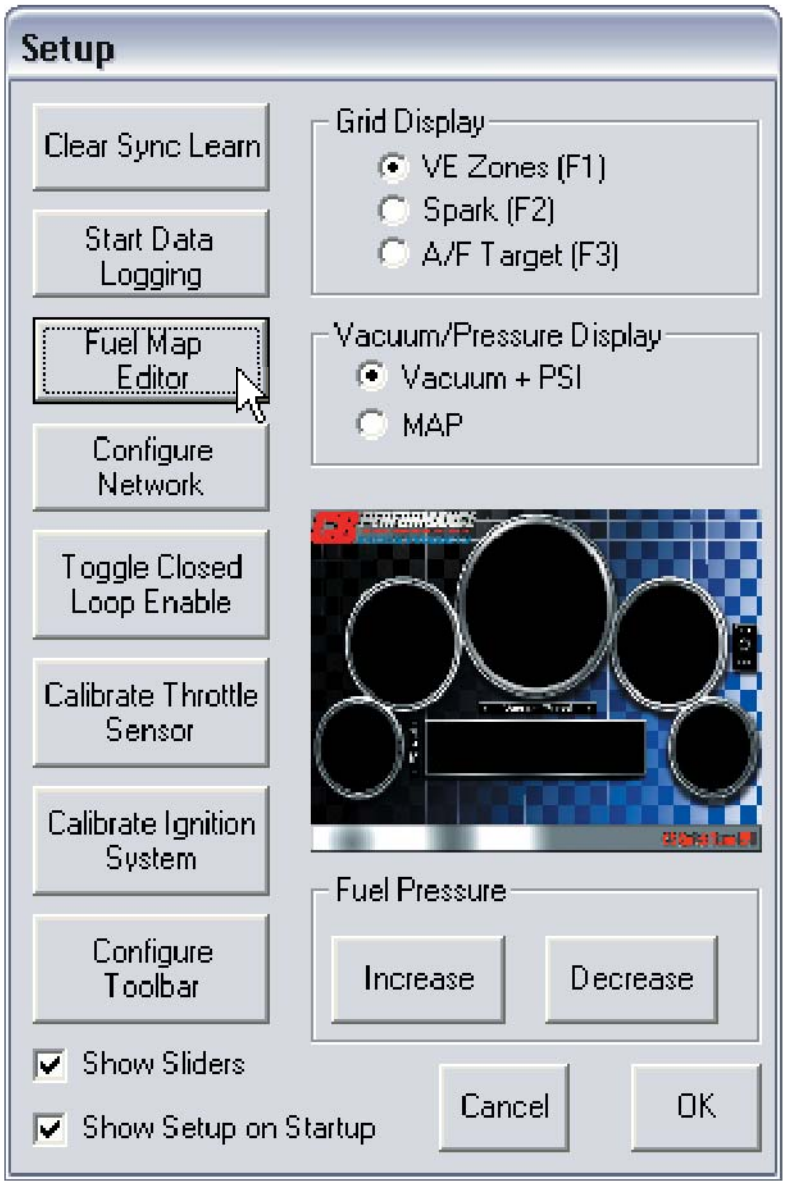
B) Left click on Setup in the dash board to open the Setup window.

C) Left click on "Fuel Map Editor"

NOTE

In most situations the use of the fuel Map Editor is not needed. Serious engine damage can result in the improper use of the Fuel Map Editor.

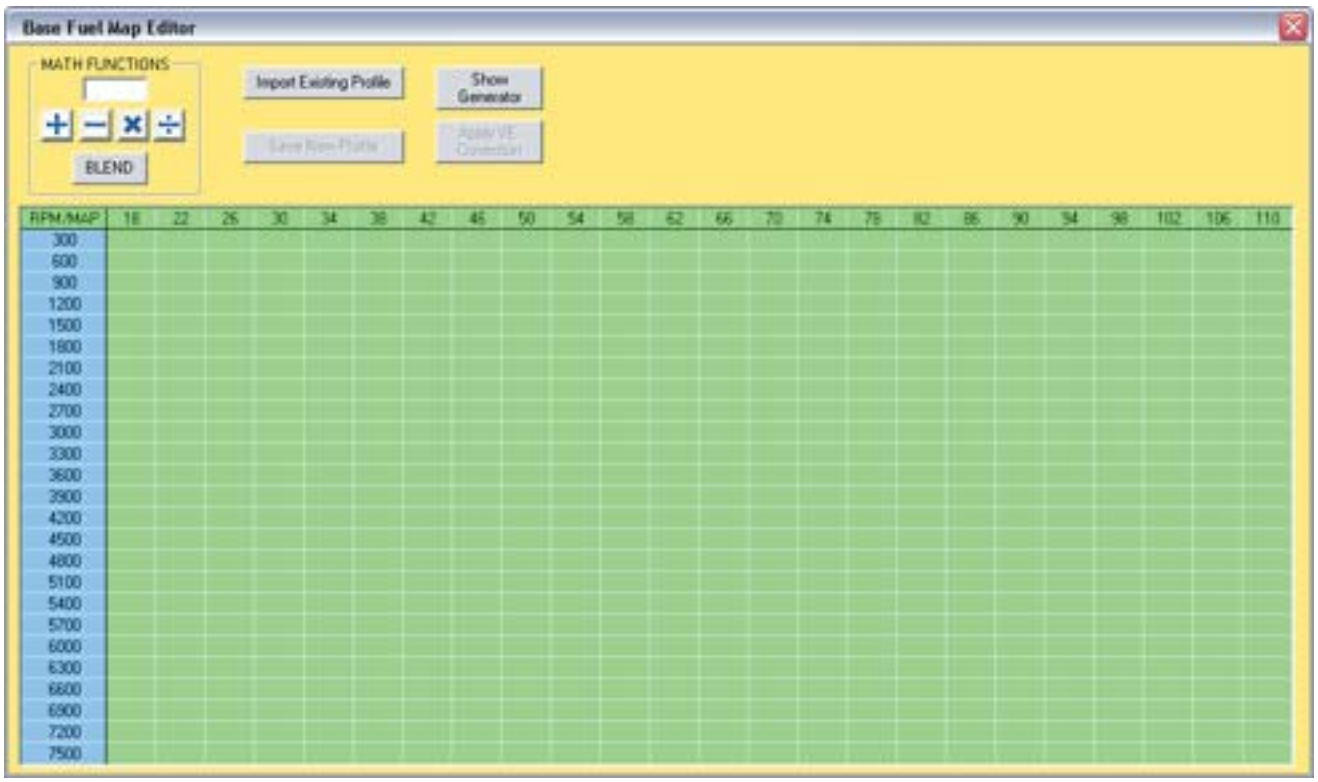
Step C



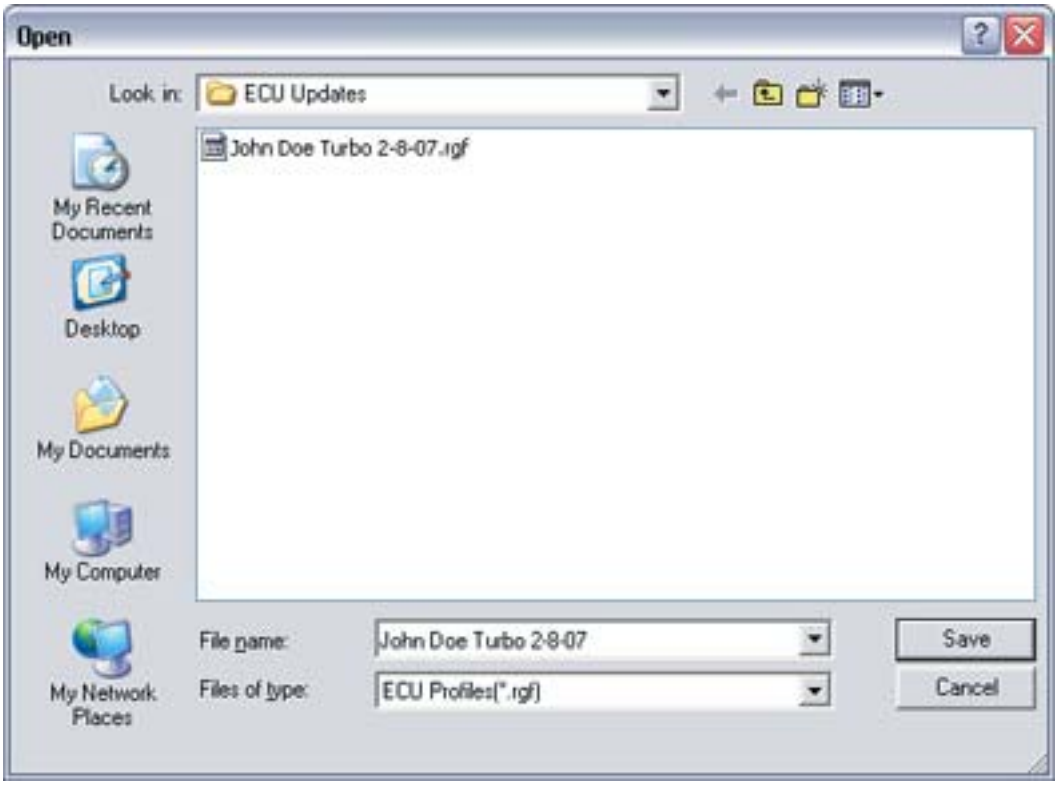
D) A warning window will pop up. To continue, you will need to accept the "Terms of Agreement"

Step D

E) After accepting the Terms of Agreement in the Fuel Map Editor, you need to import your original profile that was saved before start up.

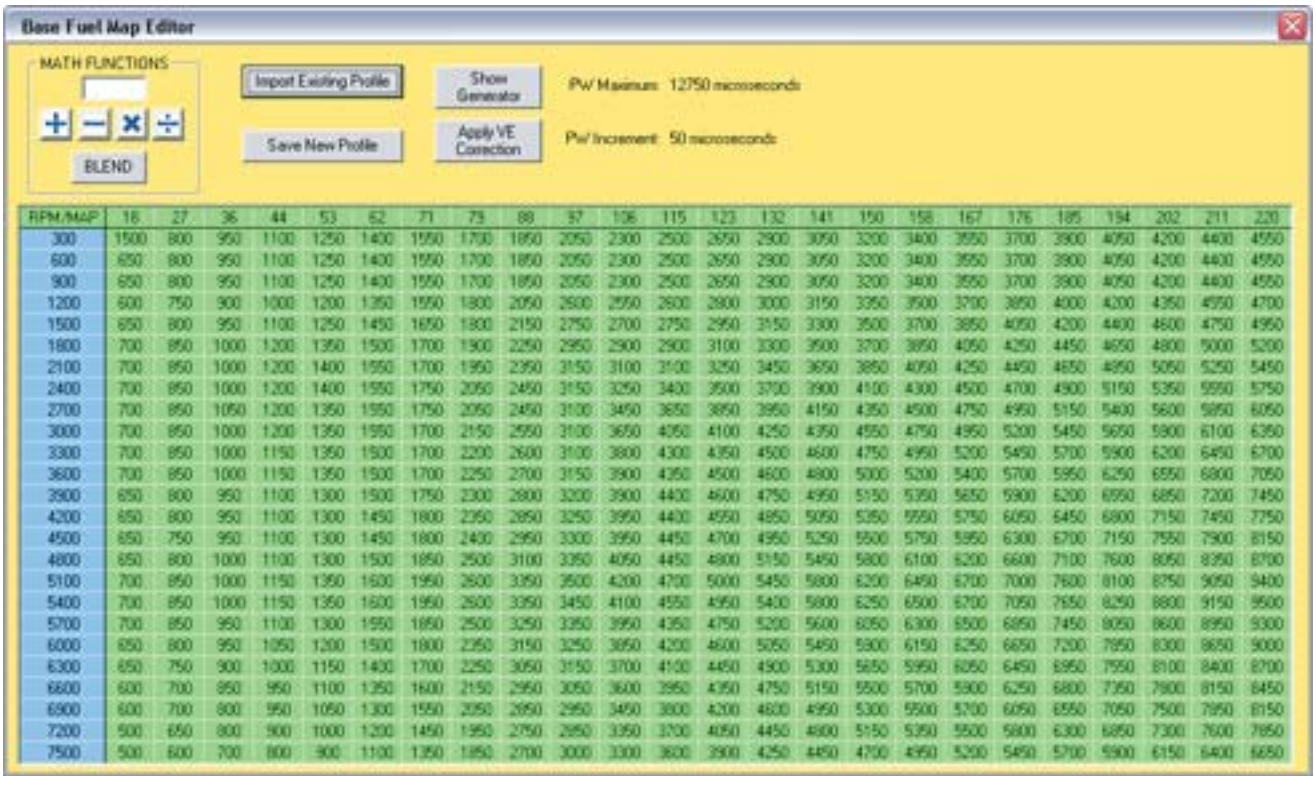


F) A window will pop up showing your original profile you saved. Left click on this file and then left click "Open"



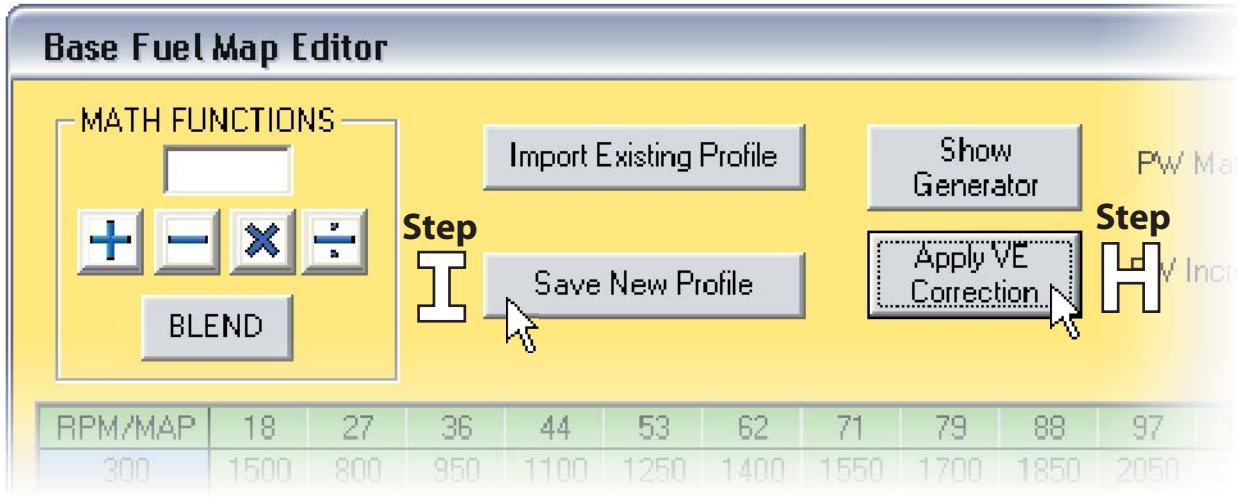
G) After opening your original profile, you will notice the fuel map has been filled in with values. These values are Injector Pulse Widths measured in milliseconds. Notice that the values range from low at idle to high at wide open throttle. Some engines will idle around 1.550 milliseconds while others will idle at 2.225 milliseconds. Some engines will want 5.220 milliseconds at wide open throttle where as others will want 8.560. Just remember that the numbers you see in the cells are the amount of time the injectors are open measured in milliseconds.

Example - A value of 2.650 is the amount of time the injector is open in milliseconds



RPM/MAP	16	27	36	44	53	62	71	79	88	97	106	115	123	132	141	150	158	167	176	185	194	202	211	220
300	1500	800	950	1100	1250	1400	1550	1700	1850	2050	2300	2500	2650	2900	3050	3200	3400	3550	3700	3900	4050	4200	4400	4550
600	650	800	950	1100	1250	1400	1550	1700	1850	2050	2300	2500	2650	2900	3050	3200	3400	3550	3700	3900	4050	4200	4400	4550
900	650	800	950	1100	1250	1400	1550	1700	1850	2050	2300	2500	2650	2900	3050	3200	3400	3550	3700	3900	4050	4200	4400	4550
1200	600	750	900	1000	1200	1350	1550	1800	2050	2600	2550	2600	2800	3000	3150	3350	3500	3700	3850	4000	4200	4350	4550	4700
1500	650	800	950	1100	1250	1450	1650	1800	2150	2750	2700	2750	2950	3150	3300	3500	3700	3850	4050	4200	4400	4600	4750	4950
1800	700	850	1000	1200	1350	1500	1700	1900	2250	2950	2900	2900	3100	3300	3500	3700	3850	4050	4250	4450	4650	4800	5000	5200
2100	700	850	1000	1200	1400	1550	1700	1950	2350	3150	3100	3100	3250	3450	3650	3850	4050	4250	4450	4650	4850	5050	5250	5450
2400	700	850	1000	1200	1400	1550	1750	2050	2450	3150	3250	3400	3500	3700	3900	4100	4300	4500	4700	4900	5150	5350	5550	5750
2700	700	850	1050	1200	1350	1550	1750	2050	2450	3100	3450	3650	3850	3950	4150	4350	4500	4750	4950	5150	5400	5600	5850	6050
3000	700	850	1000	1200	1350	1550	1700	2150	2550	3100	3650	4050	4100	4250	4350	4550	4750	4950	5200	5450	5650	5900	6100	6350
3300	700	850	1000	1150	1350	1500	1700	2200	2600	3100	3800	4300	4350	4500	4600	4750	4950	5200	5450	5700	5900	6200	6450	6700
3600	700	850	1000	1150	1350	1500	1700	2250	2700	3150	3900	4350	4500	4600	4800	5000	5200	5400	5700	5950	6250	6550	6800	7050
3900	650	800	950	1100	1300	1500	1750	2300	2800	3200	3900	4400	4600	4750	4950	5150	5350	5650	5900	6200	6550	6850	7200	7450
4200	650	800	950	1100	1300	1450	1800	2350	2850	3250	3950	4400	4550	4850	5050	5350	5550	5750	6050	6450	6800	7150	7450	7750
4500	650	750	950	1100	1300	1450	1800	2400	2950	3300	3950	4450	4700	4950	5250	5500	5750	5950	6300	6700	7150	7550	7900	8150
4800	650	800	1000	1100	1300	1500	1850	2500	3100	3350	4050	4450	4800	5150	5450	5800	6100	6200	6600	7100	7600	8050	8350	8700
5100	700	850	1000	1150	1350	1600	1950	2600	3350	3500	4200	4700	5000	5450	5800	6200	6450	6700	7000	7600	8100	8750	9050	9400
5400	700	850	1000	1150	1350	1600	1950	2600	3350	3450	4100	4550	4950	5400	5800	6250	6500	6700	7050	7650	8250	8800	9150	9500
5700	700	850	950	1100	1300	1550	1850	2500	3250	3350	3950	4350	4750	5200	5600	6050	6300	6500	6850	7450	8050	8600	8950	9300
6000	650	800	950	1050	1200	1500	1800	2350	3150	3250	3850	4200	4600	5050	5450	5900	6150	6250	6650	7200	7850	8300	8650	9000
6300	650	750	900	1000	1150	1400	1700	2250	3050	3150	3700	4100	4450	4900	5300	5650	5950	6050	6450	6950	7550	8100	8400	8700
6600	600	700	850	950	1100	1250	1600	2150	2950	3050	3600	3950	4350	4750	5150	5500	5700	5900	6250	6800	7350	7900	8150	8450
6900	600	700	800	950	1050	1300	1550	2050	2850	2950	3450	3800	4200	4600	4950	5300	5500	5700	6050	6550	7050	7500	7850	8150
7200	500	650	800	900	1000	1200	1450	1950	2750	2850	3350	3700	4050	4450	4800	5150	5350	5500	5800	6300	6850	7300	7600	7850
7500	500	600	700	800	900	1100	1350	1850	2700	3000	3300	3600	3900	4250	4450	4700	4950	5200	5450	5700	5900	6150	6400	6650

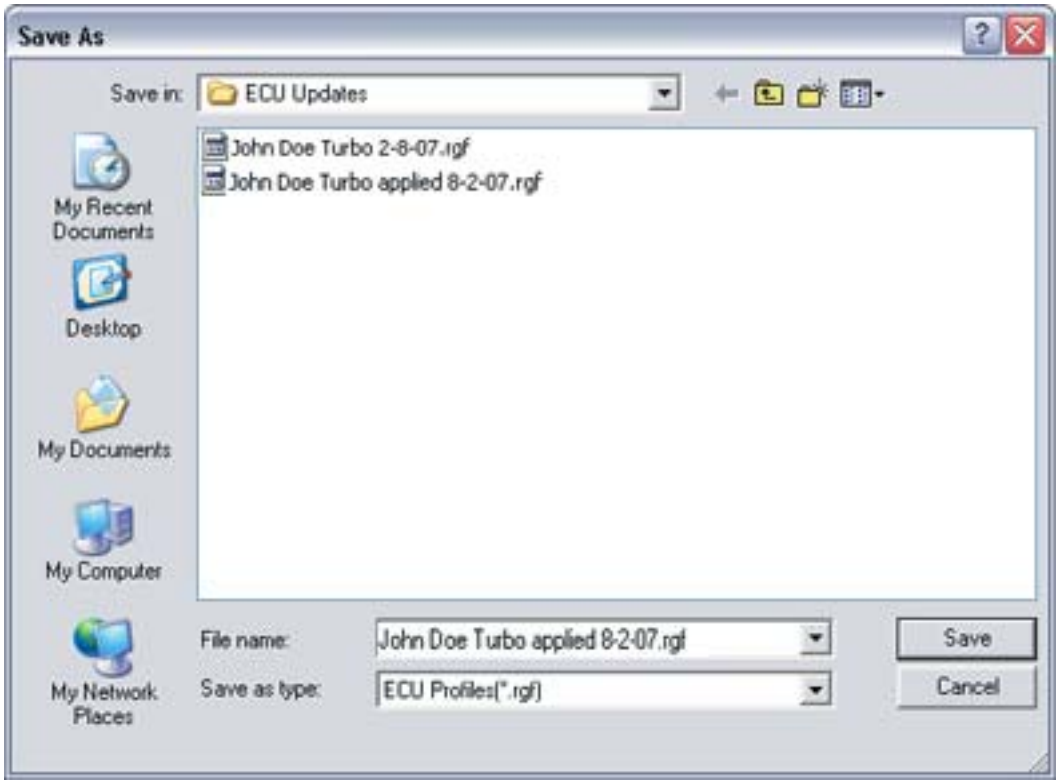
H) After opening your original profile, you will need to apply the VE correction. Left click on "Apply VE Correction." You will notice that the fuel map editor has now changed the injector pulse widths using the learned VE Zone values.



I) Next, you will need to save your new updated profile. Left click on "Save New Profile" A window will pop up asking you to name the new profile.

NOTE

It is a good idea at the end of your profiles name the type Applied and the date. **Example** - John Doe Turbo applied 8-2-07

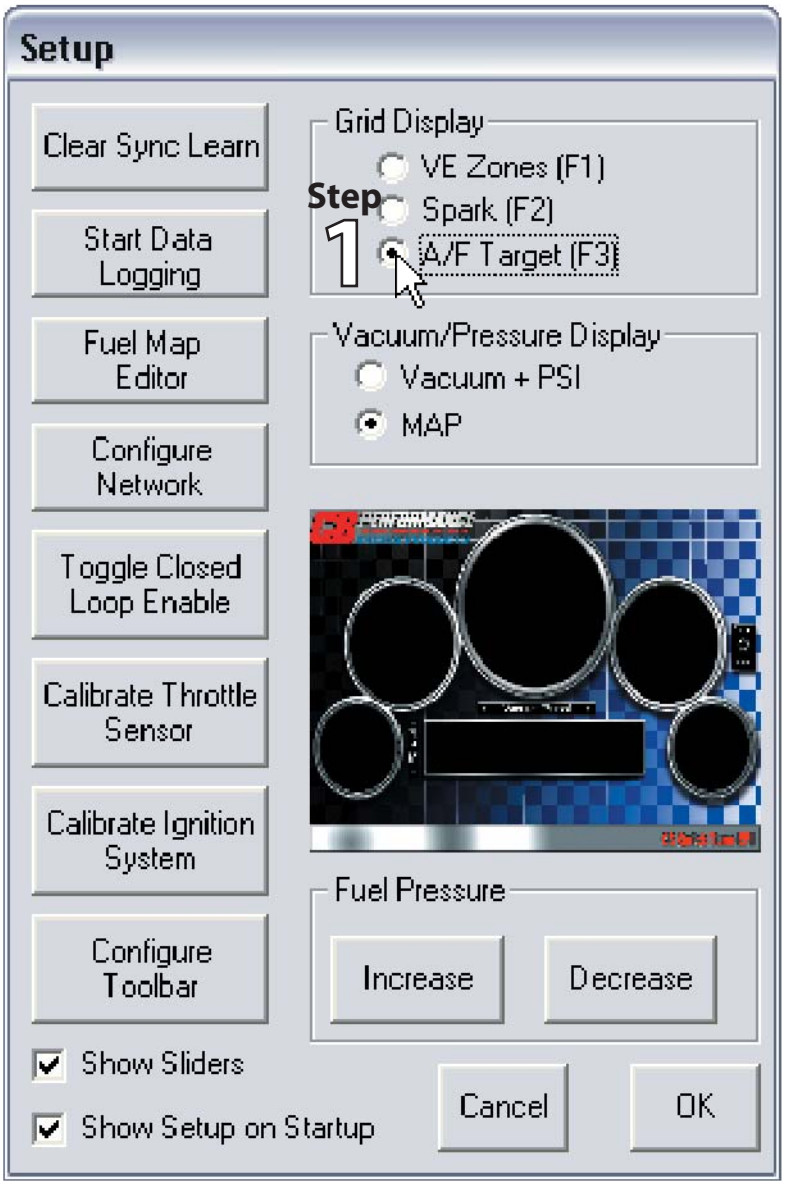


Calibrating The Throttle Position Sensor after Loading A New Profile

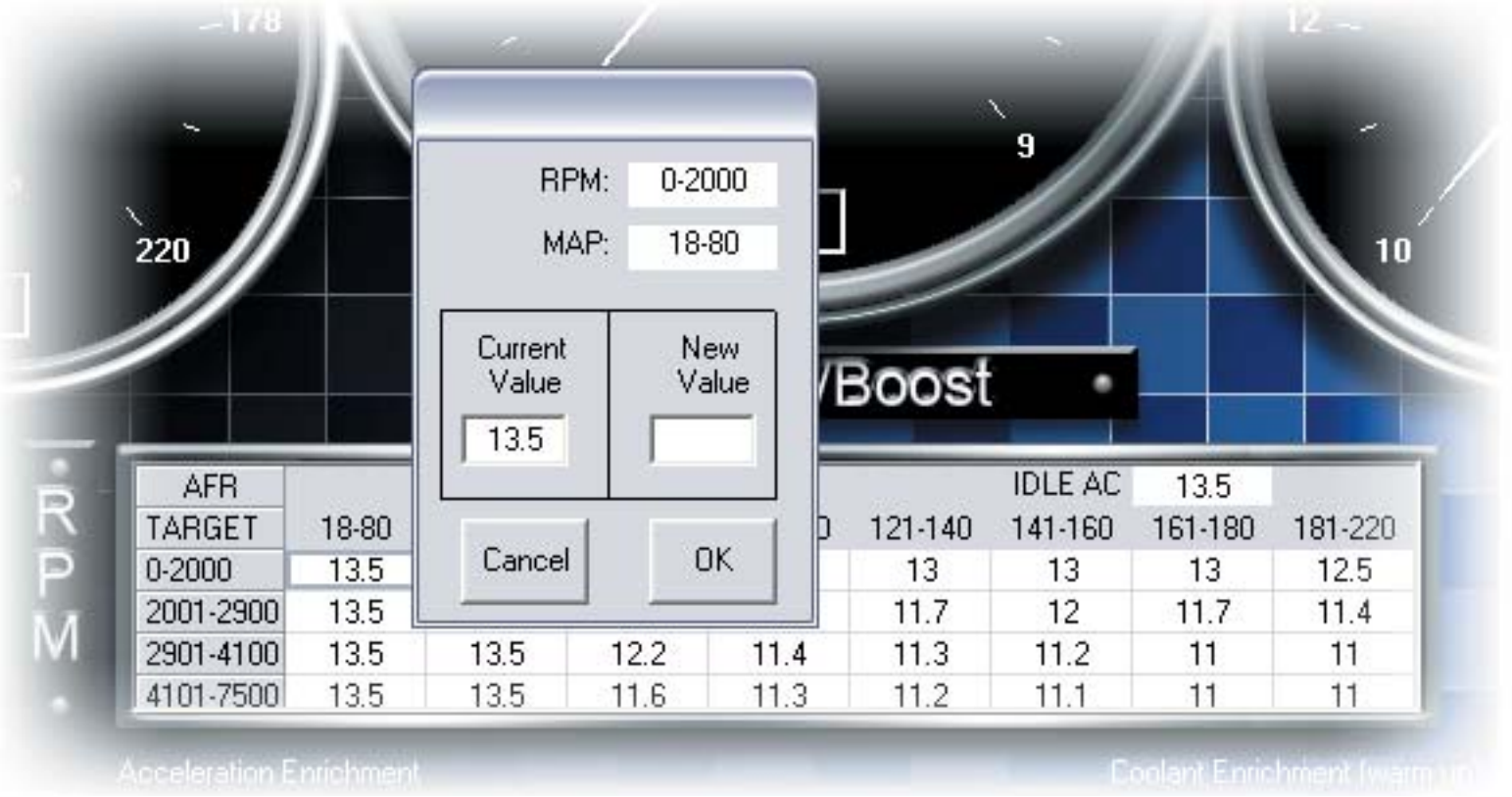
1) Every time you load a new profile into your EMS, whether it be an applied profile, a file loaded from the Web or your original, you need to recalibrate your Throttle position Sensor. Refer to the Calibrating Throttle Position Sensor" in step 3 of this manual for calibrating procedures.

Setting Target Air Fuel Ratio's

1) In the Setup of the dashboard go to the grid display in the top right hand corner. Left click on A/F Target then left click OK on the bottom of the set up window. You will now have the target air fuel ratio grid open in the grid display.



A) Left click on the particular cell you want to change and hit enter on your PC. A window will pop up showing the current air fuel target and an area to type in a new value. After typing in your new target air fuel value, hit enter and the new value will program into to the cell. You can use the up and down or the side to side arrow keys to move to the next cell. Changes in the V.E Zones, Target Air/Fuel Zones and Timing Zones are real time. You do not have to program the ECU after making a change. As soon as you click on "enter" of your PC the EMS is programmed with the new value.

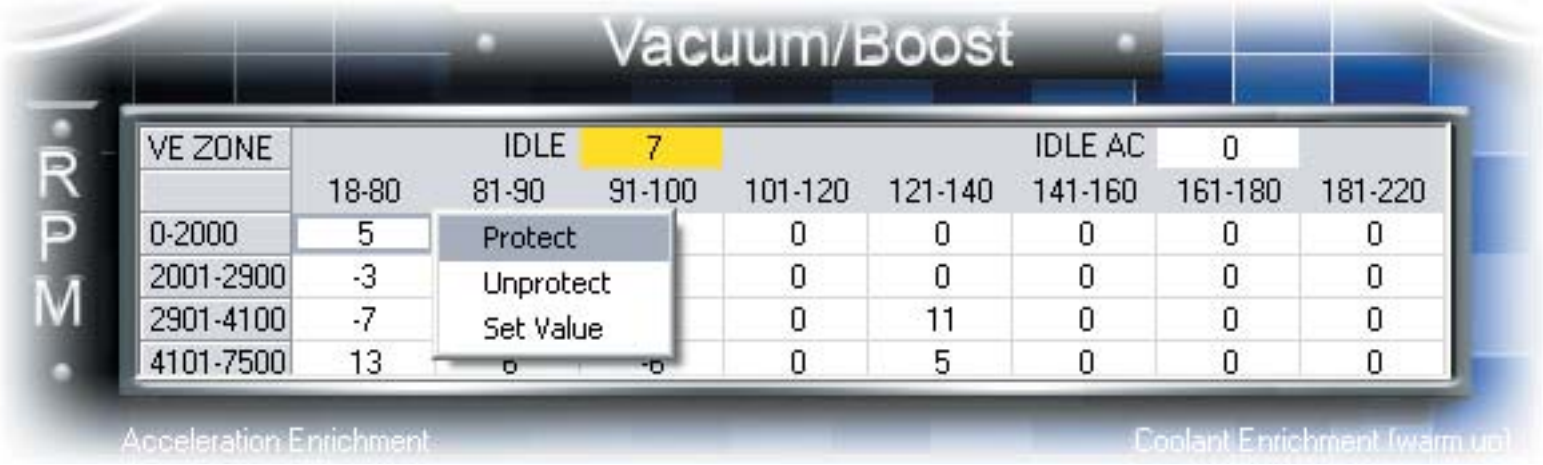


NOTE

You will lose all your VE Zone, Target Air/Fuel Zone and Timing Zone values if you load a new profile into the EMS.

Protecting Zones in the Fuel Map Editor

1) In some situations, the protection of zones in the VE Zone Grid display will help in tuning your vehicle. When a VE Zone is protected, the "Learn" feature of the EMS will not function in that particular Zone. The most common area for protecting Zones is the first RPM/Load column in the VE Zone grid display. Your engine typically shares this column of zones in free revving and very light load conditions, such as cruising on flat surfaces. In free revving, the EMS will pull out fuel since the engine has no load. In cruising, the engine will add fuel since it has more load than free revving. Basically these two conditions fight each other for the proper air fuel ratio. It is important to remember while in Protected Zones, Closed Loop is still functioning, the EMS is still targeting your "Target Air Fuel Ratio". It is only that the EMS is not learning while in these Protected Zones.

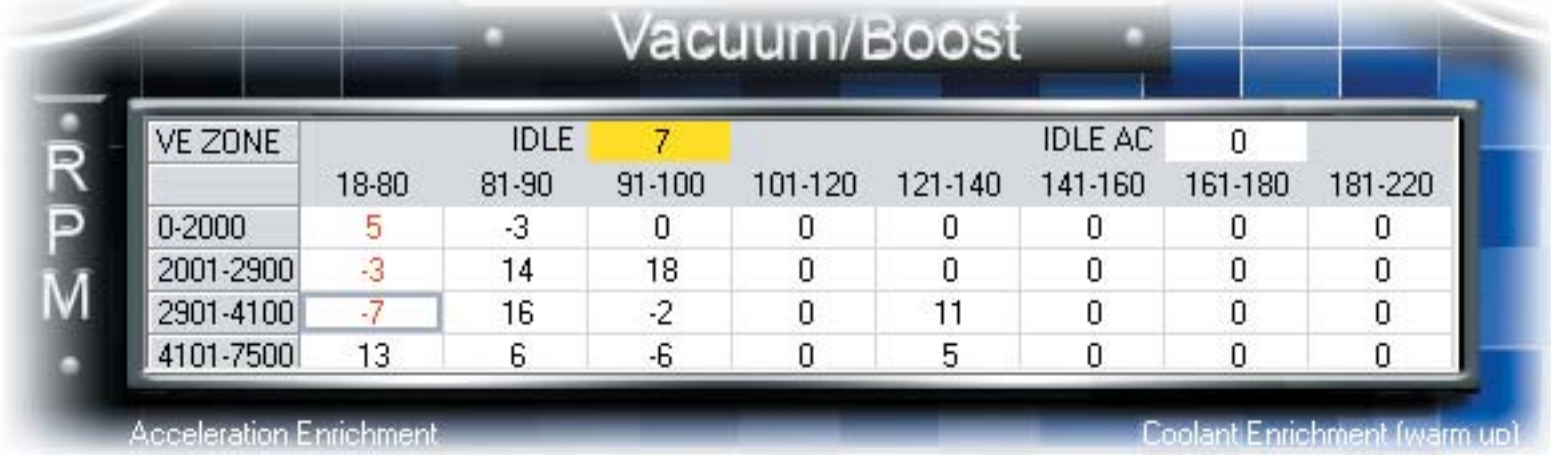


A) Protecting a zone is very simple. Open the Setup window in the dashboard, and left click on VE Zones in the Grid Display. Find the zone you want to protect and left click on it. Hit "Enter" on your PC and a window will pop up giving the option to, "Set Value" or "Protect Value" or "Unprotect Value". Select "Protect Value". Notice that the Zone you protected in the VE Zone Grid Display turns the color red. This lets you know that that particular Zone is Protected.

B) You can also set a richer or leaner value in any zone and then protect it. A common reason for this is a flat or "Lean" spot off idle. Usually you will only want to set a richer value and protect it in the upper left corner of the VE Zone Grid Display. This is where your rpm and load drops to when you free rev or let out on the clutch from a dead stop.

C) Watch what area your RPM/Load hits while driving or free revving. In that area, type in a richer value and then protect that zone. You may need to go back a few times, selecting richer values until you are happy with the results.

> **Example** - I free rev my engine and I notice the Zone that has a "Lean" spot has the value -14 in it. To richen this Zone, I will type in a value of 2 and Protect it. I have now richened that area 16 percent. It is that easy.



Creating Your Own Fuel Map

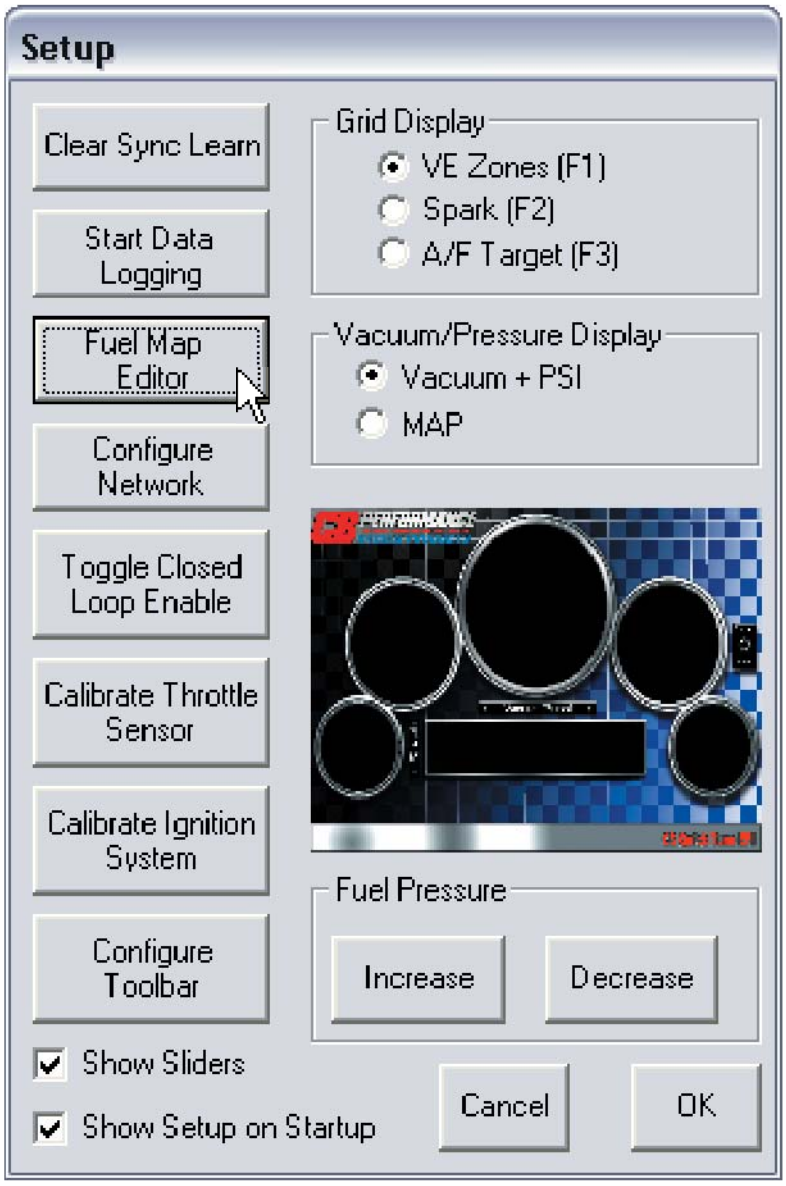
1) Some experienced EFI Tuners want to create their own fuel map. Your CB quick Tune EMS has the capability to do this.

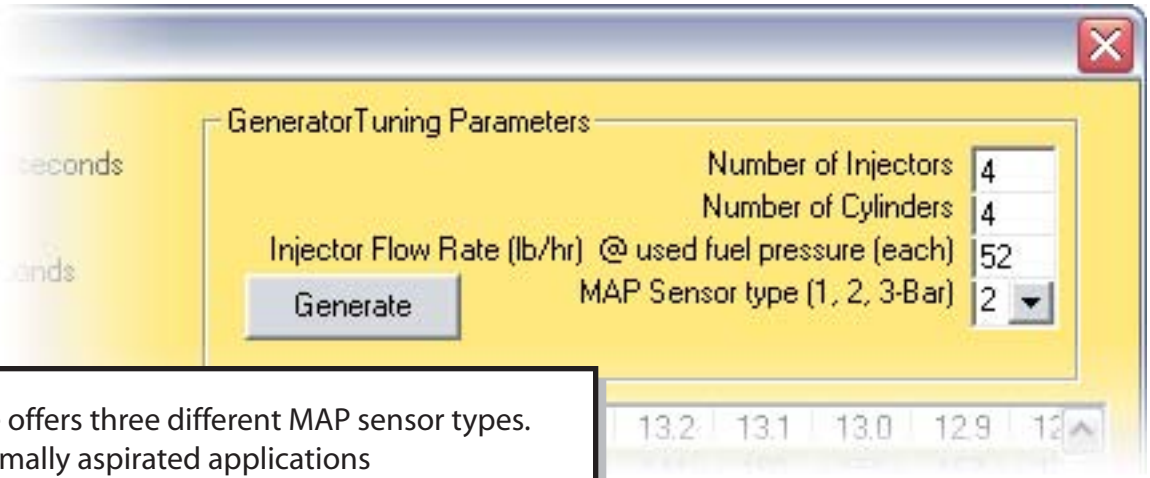
A) To create your own fuel map, left click on Setup in the dash board. In the Setup window, left click on "Fuel Map Editor". Once you accept the terms of use, the Fuel Map Editor will open.

B) Left click on "Show Generator" The Fuel Map Editor will open.

C) The next step is to fill in the Generator Tuning Parameters in the upper right hand side of the Generator window.

D) In the "General Tuning Parameters" select the number of cylinders, number of injectors, Size of the injectors in lb per hour, and map sensor type.





NOTE

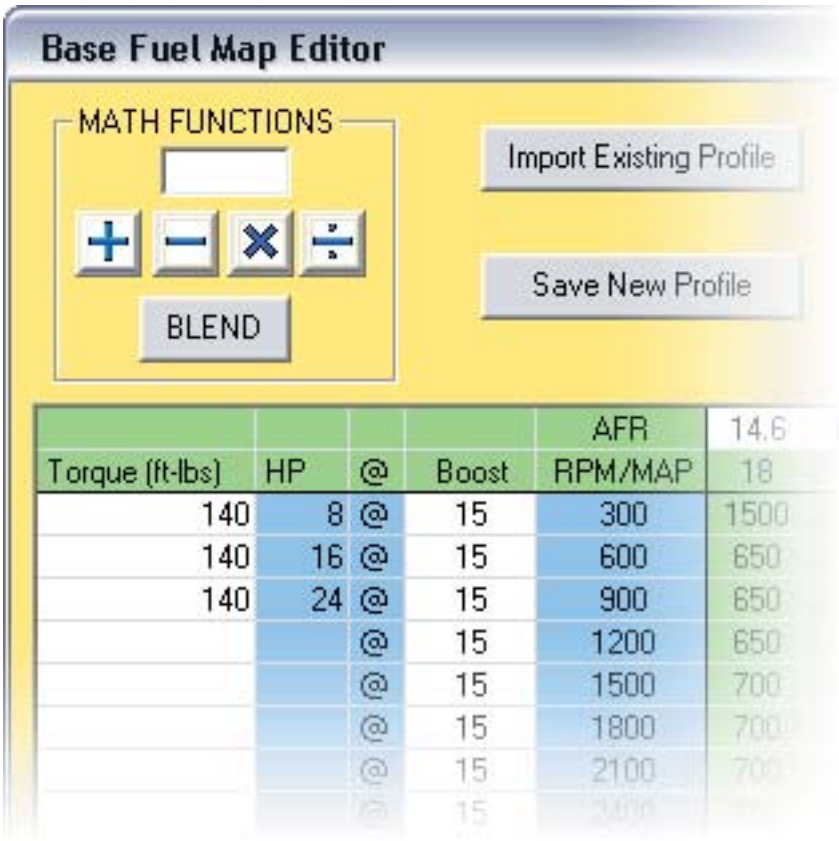
CB Performance offers three different MAP sensor types.
1 BAR for all normally aspirated applications
2 BAR for turbo applications up to 18 psi boost pressure
3 BAR for turbo applications up to 30 psi of boost pressure

NOTE

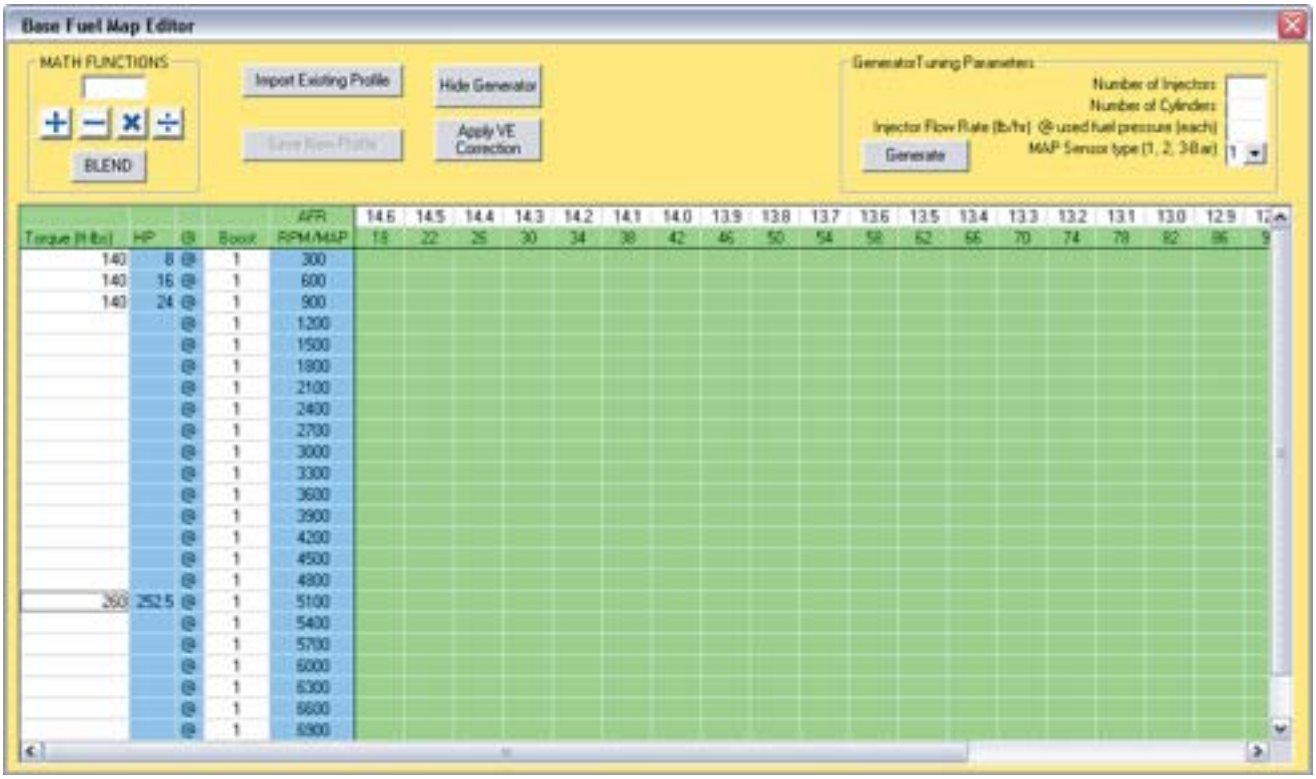
Unless specified upon time of order of your Kit, every CB Quick Tune EFI kit is shipped with either a 1Bar Map sensor for normally aspirated engines or a 2bar for turbo engines.

E) The next step is to fill in the torque values of your engine. A good rule of thumb is to put in the same value in the first three cells of the torque column. This area is where your engine idles and you do not want the injector pulse width changing between these RPM's.

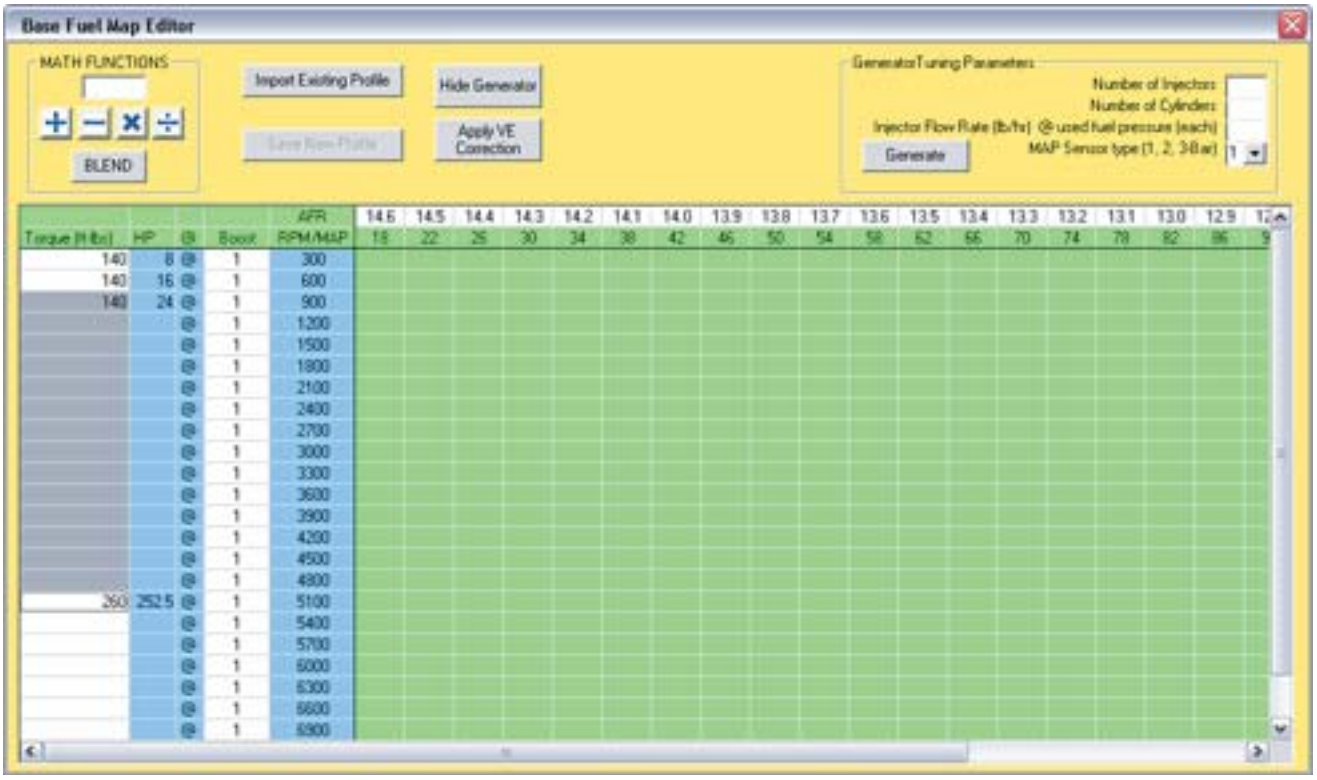
On Normally aspirated engines, a torque value of 60-80 is typical in the idle cells, where as 120-150 are typical values for turbo engines. To enter a torque value, double left click in the cell and type in the torque value.

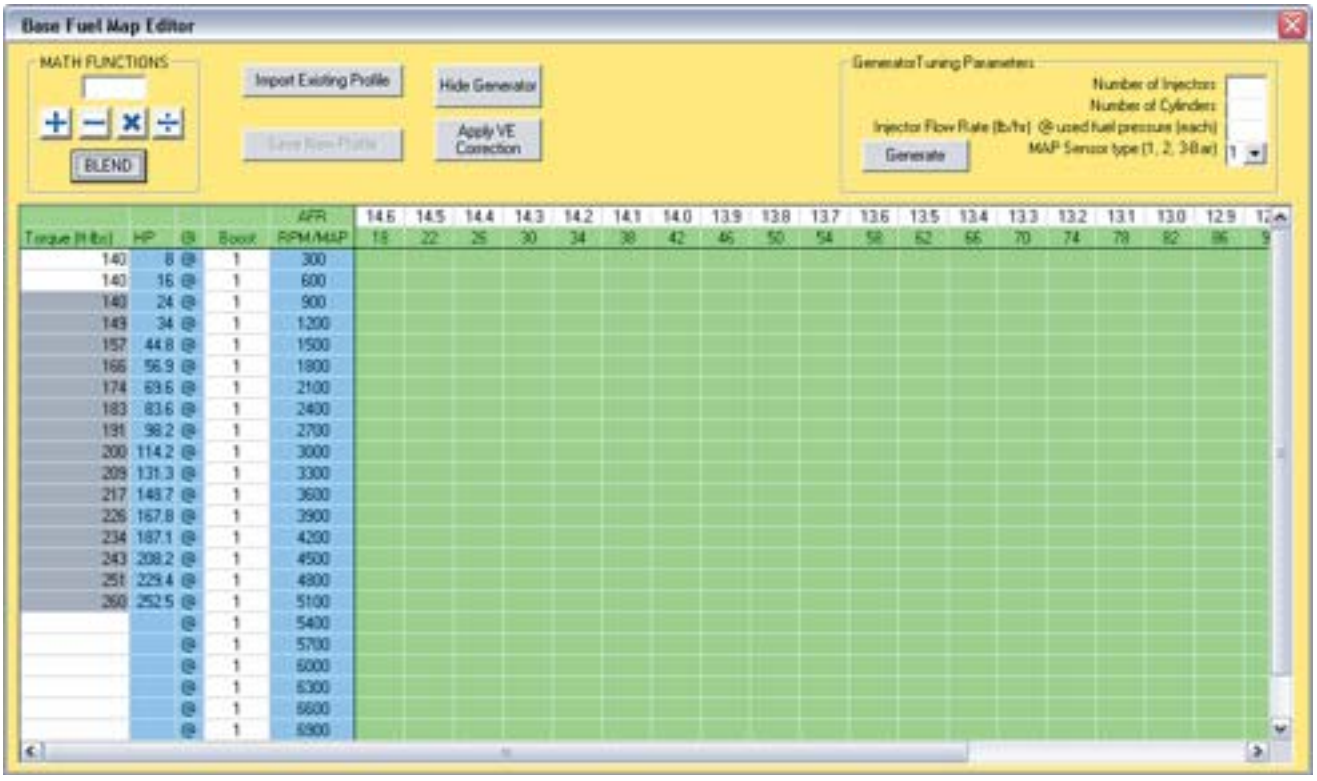


F) Go down the RPM column until you find the RPM where you believe your engine will produce peak torque. Double left click on this cell and type in your peak torque value.

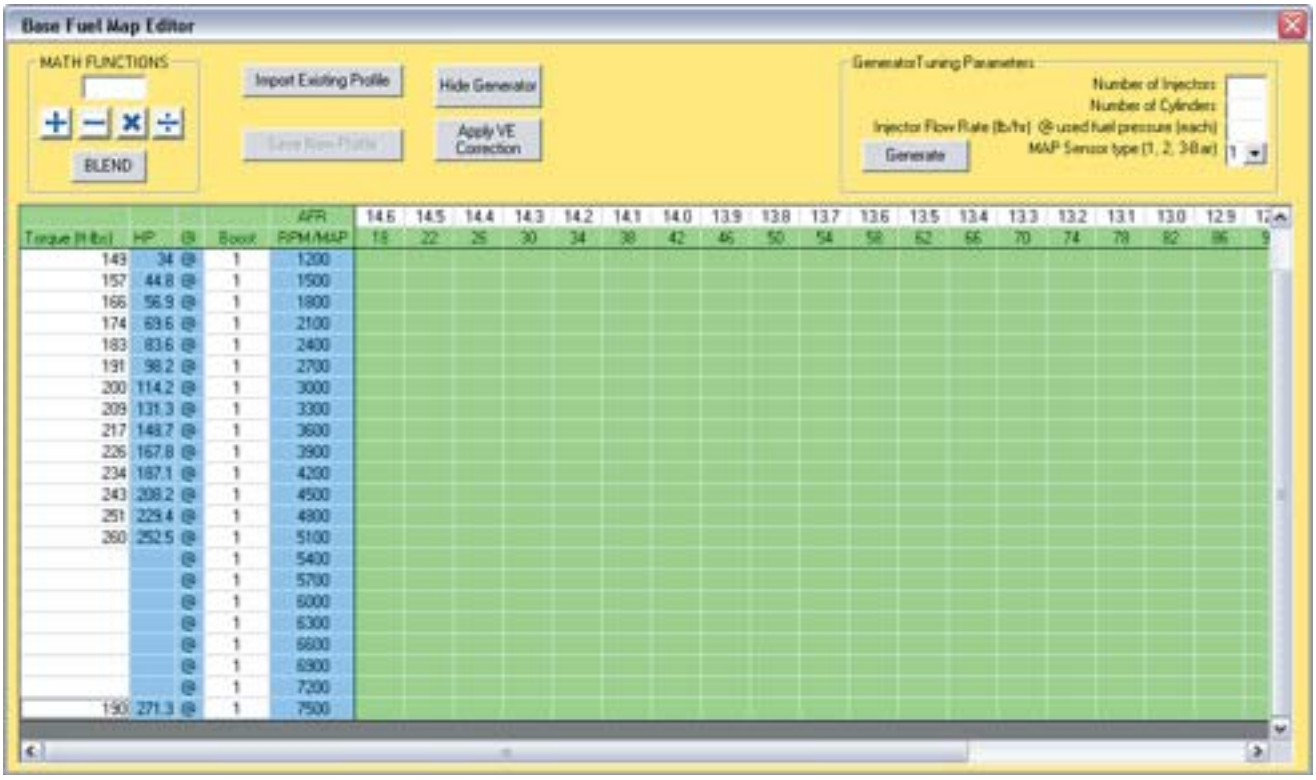


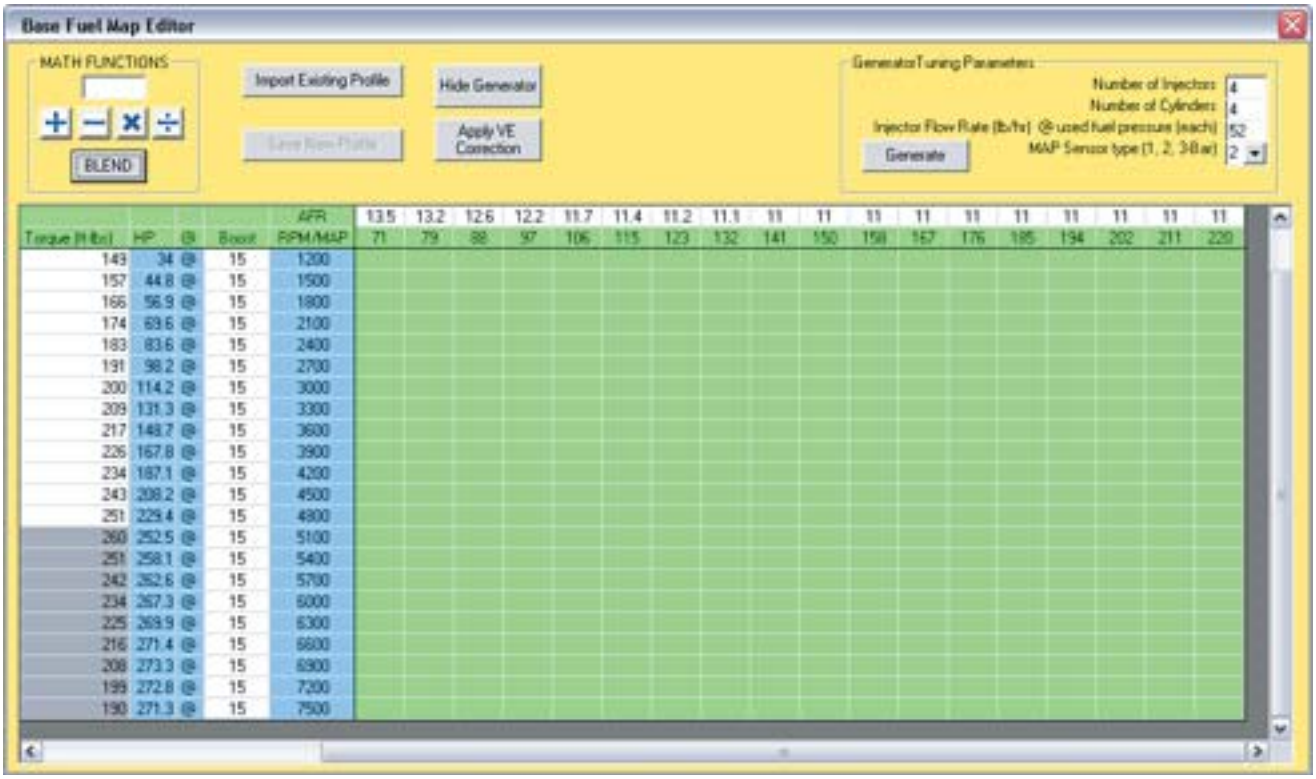
G) The next step is to blend from your peak torque cell to your idle cells. Left click and drag from the peak torque cell all the way down to your idle cell. After clicking and dragging, you will notice the entire area between idle and peak torque high lights blue. Go up to the "Math Functions" area of the Fuel Map Editor and left click on "Blend". The fuel map editor will blend a torque curve from idle to peak torque.





H) The next step is to fill in your torque value in the 7500 rpm cell. After typing in your engines torque value in this cell, left click and drag up to your peak torque cell. Again, the area in between the two cells will high light blue. Go back to the "Math Functions" area in the fuel map editor and click on "Blend". The fuel map editor will blend the torque curve from peak torque up to 7500 rpm's.

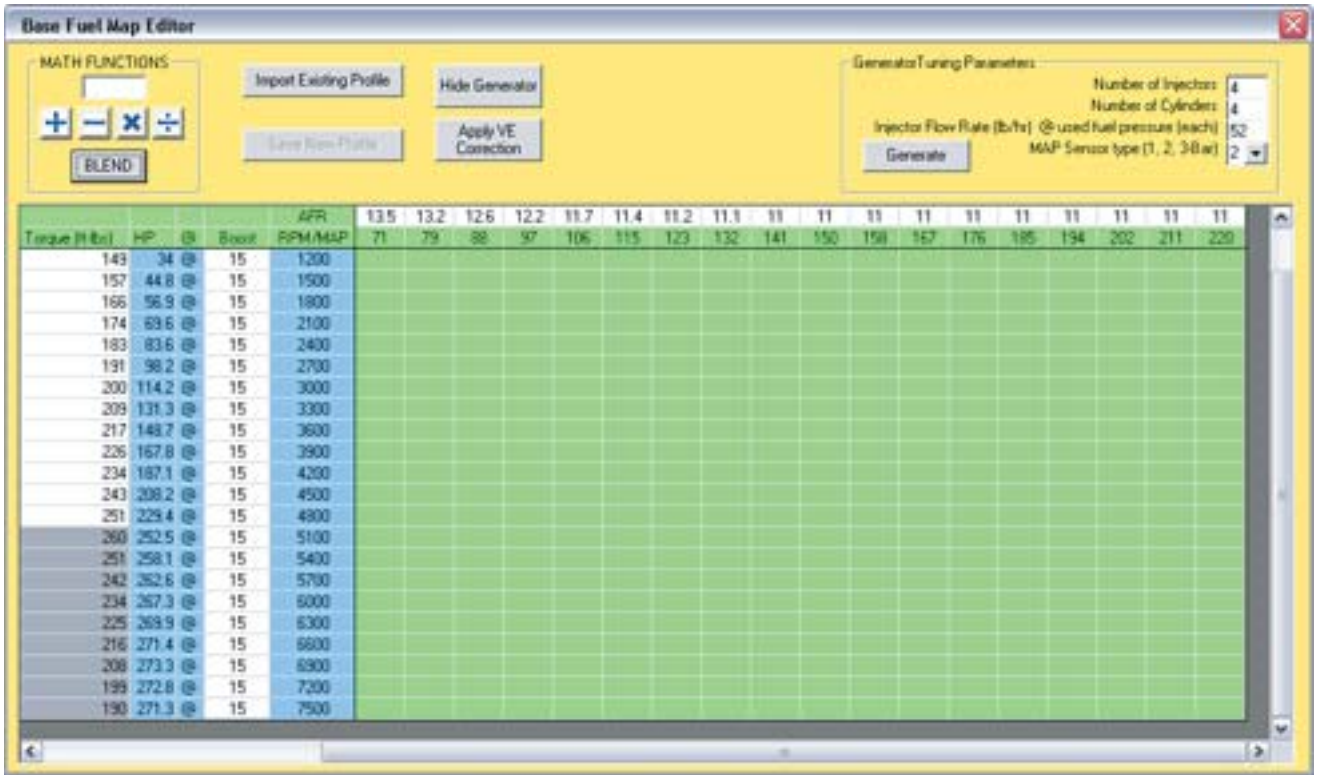




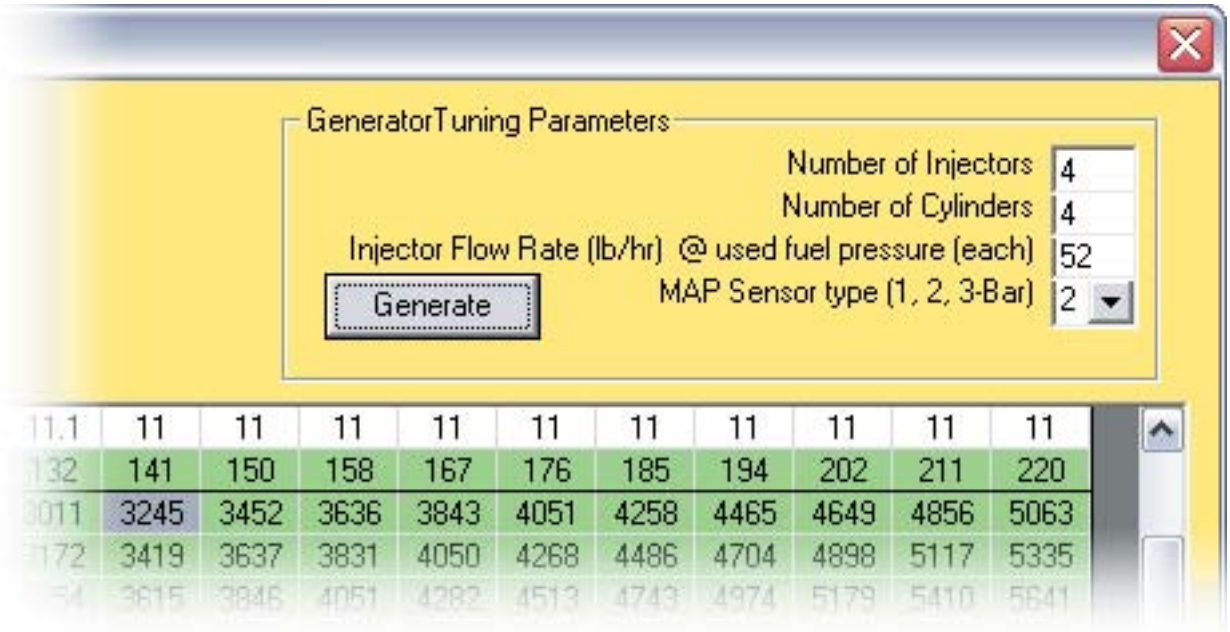
I) Next, fill in your target air fuel ratio's in the fuel map editor. Go to the target air fuel ratio column in the fuel map editor. You have the choice of picking your target air fuel ratios from idle to wide open throttle or "High Vacuum to Zero Vacuum"

NOTE

Normally aspirated engines respond well to target air fuel ratios from 13.0-14.1 air fuel at an idle to 12.5-13.1 air fuel at wide open throttle. Each engine is different so you will need to do some testing. Turbo engines respond well between 12.5 to 13.5 air fuel ratio at idle to 10.5-11.5 air fuel ratio at wide open throttle.



J) The next step is to generate your new fuel map. Go to the "Generator Tuning parameters" area on the top right of the fuel Map editor. Left click on generate. This will generate a entire fuel map based off of your engine torque values, target air fuel ratio's, injector size, map sensor type and number of cylinders.



K) After you have generated your new fuel map, you will need to save it. Left click on "Save New profile" you will be asked to give your new profile a name.

NOTE

It is a good idea to name your new generated profile using generated profile and then the date at the end of the name. **Example** - John Doe turbo generated 8-3-07. This will help determine this generated profile from an applied profile or the original profile you saved on start up.

L) After naming your new profile, close out the fuel map editor. Go up to "Update" in the dash board and left click on "Load Profile To EMS". Select the generated profile you just made and left click on "Open"

NOTE

Make sure after loading your new generated profile, you re-calibrate your Throttle Position Sensor" Refer to "Calibrating Throttle Position Sensor" in Step 3 of this manual.

Math Functions In The Fuel Map Editor

1) In some situations, just changing specific area's of the fuel map is all that is needed to tune your engine. You have the capability to change specific area's of your fuel map by using the "Math Functions" in the Fuel Map editor.

A) Locate the area of the fuel map you would like to change. Left click and drag around the area selected to change. Always pick at least two rows in the fuel map to change. You will notice after clicking and dragging that the selected area high lights in blue.

B) In the "Math Functions" you can add, subtract multiply or divide. It is important to remember when multiplying or dividing that the #1 means no change.

Example#1 - 1 x 2.560 inj. pulse width = 2.560 inj. pulse width.

Example#2 - 1 divided by 2.560 inj. pulse width= 2.560 inj. pulse width.

C) Typing in .8 in the "Math Functions" and then left clicking on the X or multiply will decrease the selected area of the fuel map by 20 percent.

Example#3 - .8 x 2.560 inj. pulse width= 2.048 inj. pulse width. A decrease of 20 percent.

D) Where as typing in 1.2 and left clicking on the X or multiply will increase the selected area of the fuel map by 20 percent.

Example#4 - 1.2 x 2.560 inj. pulse width= 3.072 inj pulse width. An increase of 20 percent

D) Typing in 100 in the "Math Functions" and then left clicking on + or addition will increase the selected area by 1 millisecond.

Example#5 - 2.560 inj. pulse width + 100= 3.560 inj pulse width. An increase of 1 millisecond.

E) Typing in 100 in the "Math Functions" and then left clicking on - or subtract will decrease the selected area by 1 millisecond.

Example#6 - 2.560 inj. pulse width - 100= 1.560 inj pulse width. A decrease of 1 millisecond.

F) Typing in 1.2 in the "Math Functions" and left clicking on divide will decrease the selected area of the fuel map by 10 percent.

Example#7 - 1.2 divided by 2.560 inj. pulse width= 2.133 inj. pulse width. A decrease of 20 percent.

Loading A Profile From the Web

1) Go to Update in the Dash board and left click on "Download Profile from the Web" Left click on "Connect" and you will be able to connect to downloadable profiles for your CB Quick Tune EMS. Here, you can access different profiles that might better suit your engine than the profile you are currently using.

A) Select a profile that resembles your engine. Left click on open and the profile will load to your EMS.

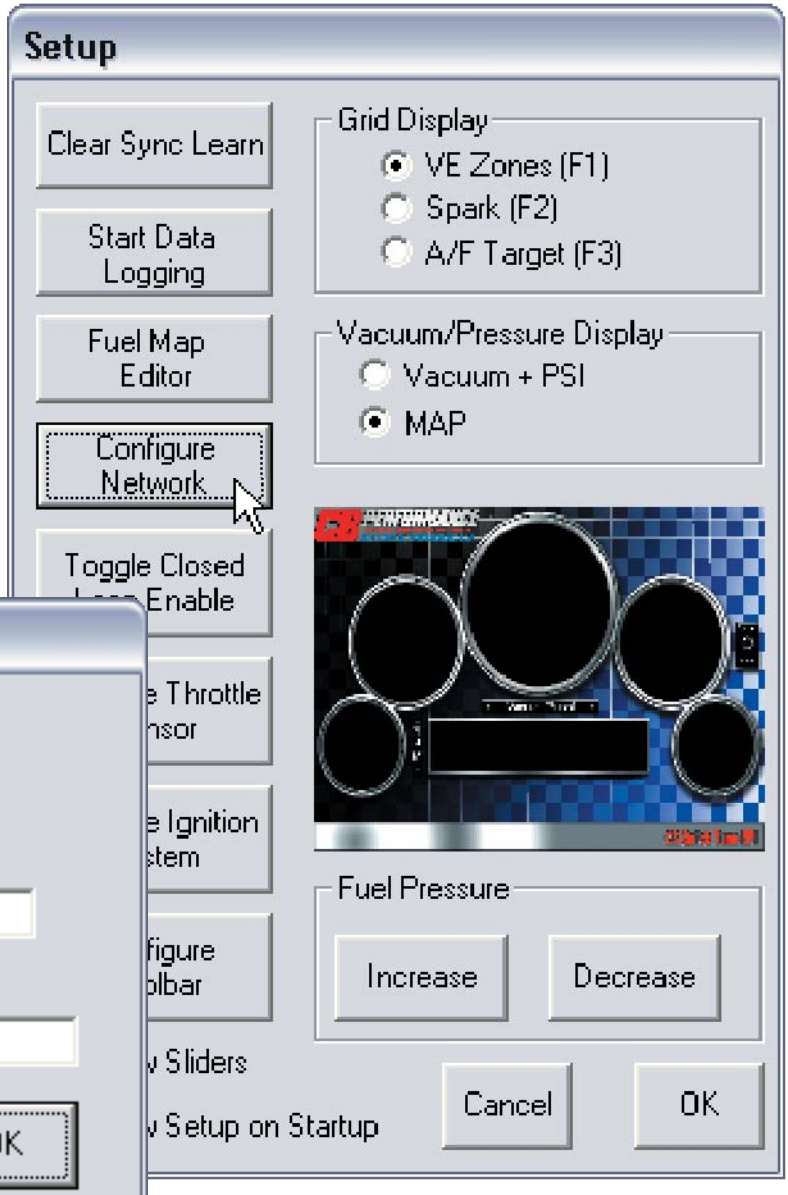
NOTE

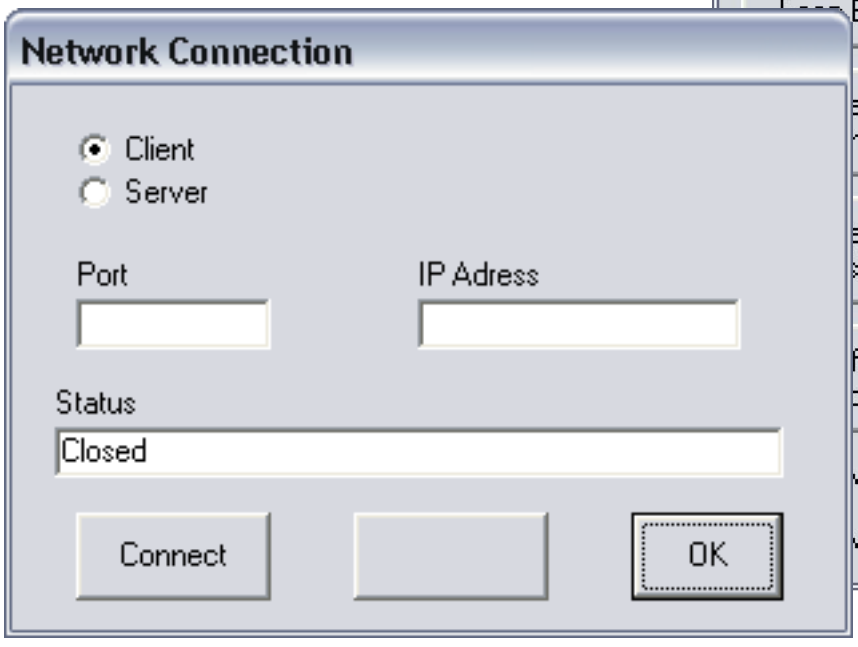
Make sure to recalibrate your Throttle Position Sensor after loading a profile from the web. Refer to "Calibrating Throttle Position Sensor" in step 3 of this manual.

On Line Support With Your CB Quick Tune EFI

1) In the set up of the dash board, select "Configure Network" Here you can type in a port and I.P Address . This allows you to go On Line with a CB EFI Tech for support.

A) You will need to call CB and ask for a EFI Tech to use this feature. CB can give you a port and I.P. Address at this time for connection.





Calibrating Your Ignition System

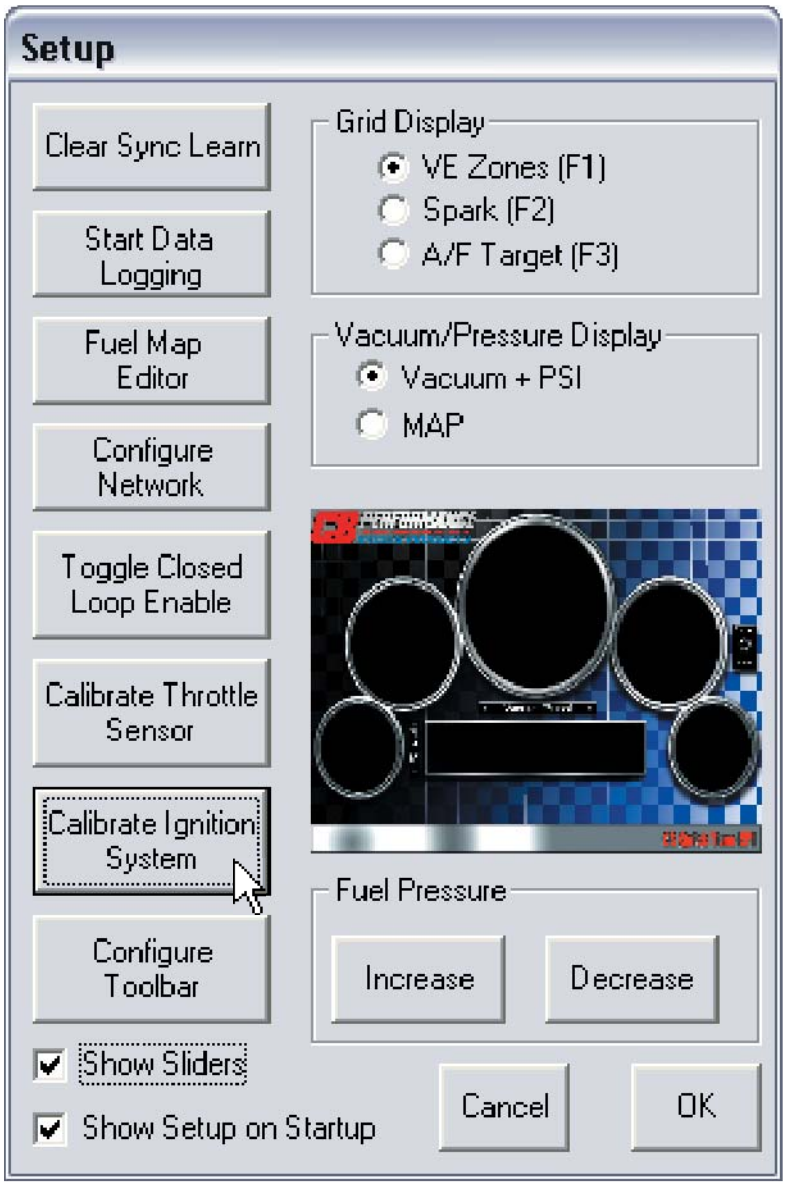
1) If you are using an ignition system that is computer controlled, it will need to be calibrated.

A) Start the car. In the set up window, select timing in the grid display. Left click OK to close out the set up window. Notice the degrees of ignition advance in the idle cell of the grid display. With a timing light, adjust the base timing of your engine until it matches the idle zone in the grid display.

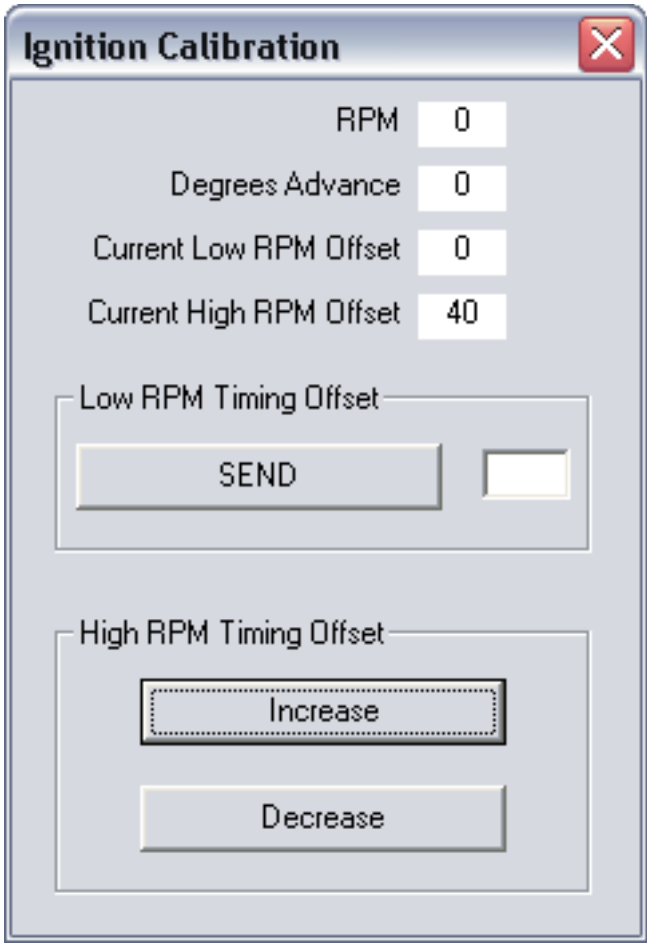
B) Rev your engine until you reach maximum advance. Compare the maximum advance of your engine to the zone in the grid display.

C) If your maximum timing of your engine does not match the corresponding zone in the grid display it will need calibrating.

D) Left click on set up of the dash board. Left click on "Calibrate ignition System".



E) You will need to put in a value in the "Current High RPM Offset" This value should be anywhere from 0 to 90. Typical a value of 40 will get you close to a correct calibration. Keep Increasing or Decreasing the value in the " High RPM Offset" until the maximum advance of your engine matches the corresponding maximum advance zone in the grid display.



F) Go back and re-check your base timing. If the timing has changed and does not match your idle timing zone after setting the High RPM Offset, it will need to be recalibrated.

G) In the "Low RPM Timing Offset" type in the amount of degrees of advance your base timing is off compared to your idle timing zone in the grid display. Left click on "Send" and your base timing of your engine is now calibrated.

NOTE

Every time you load a new profile into the EMS, you will loose your ignition timing calibration values. It is a good idea to write these values down for future reference.

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