Greddy E-manage
Installation and Tuning Information

Overview

The Emanage has a lot of functionality considering it is still a piggyback type engine management system and not a full standalone. By itself, the emanage main unit operates much like the original style Apexi AFC. You will be able to tweak the airflow signal input to the ECU to compensate for larger injectors at 5 different RPM points. However, with the available "Support Tool" software and a laptop, a whole new world of tuning will be opened up. With installation of the injector harness, ignition harness, and boost sensor, even more tuning capability is available.

The ignition harness is very simple to install. But tuning timing can be even more dangerous than playing with the fuel curves. You don't want to mess with the timing until you know what you are doing and the car is running well with the fuel adjustments you have already made. The ignition harness intercepts the ECU output signal to the coils and modifies it to adjust timing.

The injector harness is a little different since it doesn't alter the airflow signal at all. This taps into each of the 4 injector signal wires and adds additional injector duty cycle on top of what the ECU is already doing. The ECU knows nothing about this additional injection. You can add additional injection based on a few different parameters, the most useful probably being boost. To do this, you must install the pressure sensor.

There is also some additional functionality that may or may not be beneficial to you. The Anti-Engine Stall feature is supposed to be for engines with wild cams or other idling issues. If you use this feature, you can clamp the airflow signal at a certain value at predetermined RPMs and throttle positions. There is also a Boost Limiter Cut feature that can clamp the high end airflow frequency to a certain value based on RPM. If you think you want an extra fuel injector or two, the Emanage can also run 2 additional injectors based on airflow or boost pressure.

Installation

Installation is relatively simple and is much like installing an AFC. All wire connections are done at the ECU in the car. It is best to solder all connections. I opted to use the provided male and female connectors for the airflow signal wire and ignition harness wires. That way you can bypass the emanage without de-soldering. The rest I soldered since they can be easily disconnected at the emanage connector. The unit can be mounted or velcroed under the passenger seat. If you choose to install the pressure

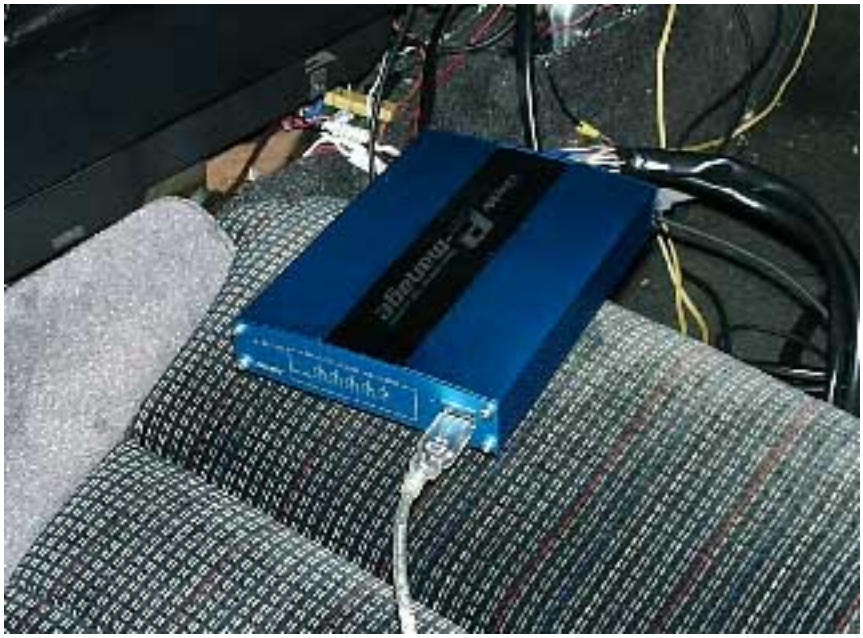
sensor, you must tap into a pressure source, mount the pressure sensor on the firewall, and run the harness through the firewall and to the Emanage.

Main Unit Installation (1G Turbo)

Main Unit Settings
The Emanage needs to be set to Mitsubishi mode before being installed. You need to remove the front cover with the provided hex wrench and turn the 3 rotary switches on the left of the front panel. Settings should be as follows for 1G and 2G cars:

Switch #	Setting
1	3
2	8
3	3

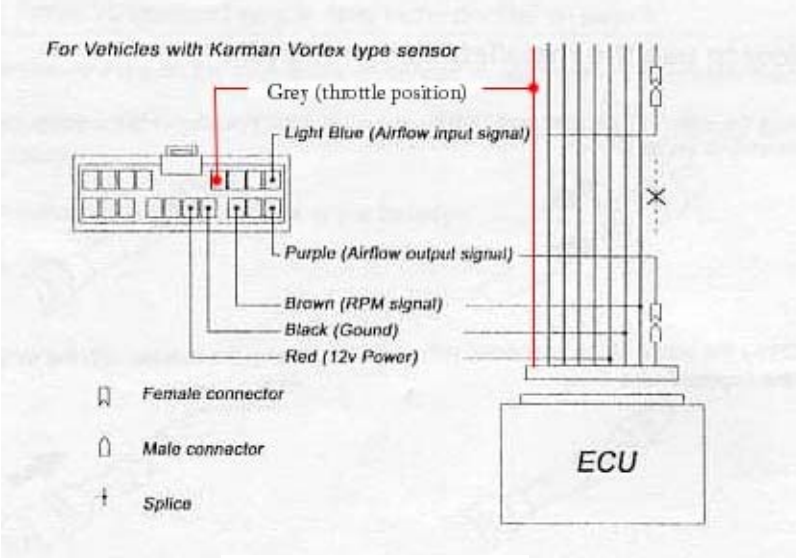
Switch 4 and 5 are for VTEC equipped cars. Don't mess with them. Don't mess with the dip switches inside the unit either.



Emanage Front Panel

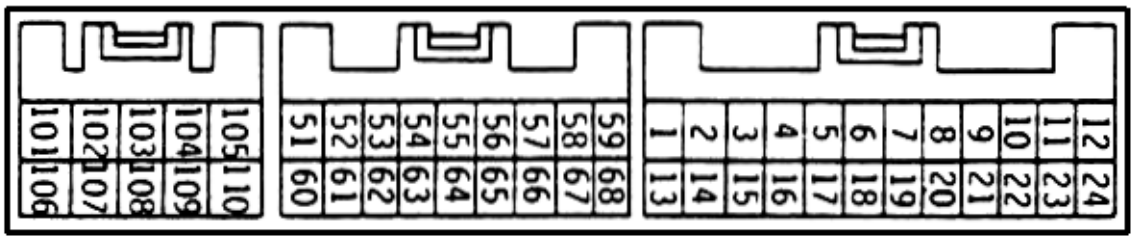
Wiring

Whatever you do, don't look at the ECU wire location chart at the back of the Emanage manual. It is completely wrong and is only there to confuse you. The initial installation consists of the same basic connections as an Apex AFC. These are power, ground, rpm signal, throttle position signal, airflow input, and airflow output. The manual forgets to mention the throttle position wire. I recommend reading through the AFC VFAQ to better prepare yourself for the emanage installation. See http://www.jgronline.com/gvr4_afc_instructions.html



Standard Installation

Emanage Wiring Table						
Emanage Operation	Wire Signal	Emanage Connector	Emanage Wire Color	ECU pinout	ECU wire color	Connection Type
Standard	Power	1	Red	102 or 107	Red	"T" -- Solder
	Ground		Black	101 or 106	Black	"T" -- Solder
	RPM		Brown	21	Black	"T" -- Solder
	Throttle		Grey	19	Green/White	"T" -- Solder
	Airflow Input		Light Blue	10 from MAS	Green/Blue	Connector
	Airflow Output		Purple	10 to ECU	Green/Blue	Connector
Additional Injection	Injector #1	1	Blue/Red	51	Yellow/Blue	"T" -- Solder
	Injector #2		Orange/Red	52	Yellow/Black	"T" -- Solder
	Injector #3		Yellow/Red	60	Light Green	"T" -- Solder
	Injector #4		Purple/Red	61	Light Green/White	"T" -- Solder
	Injector Ground		Black/Red	101 or 106	Black	"T" -- Solder
Ignition	Power Trans for #1,#4 Input	2	Blue/White	54 from ECU	Yellow	Connector
	Power Trans for #1,#4 Output		Blue/Black	54 to Transistor	Yellow	Connector
	Power Trans for #2,#3 Input		Orange/White	55 from ECU	Yellow/Red	Connector
	Power Trans for #2,#4 Output		Orange/Black	55 to Transistor	Yellow/Red	Connector
Boost	Greddy Pressure Sensor	Boost	n/a	n/a	n/a	Connector

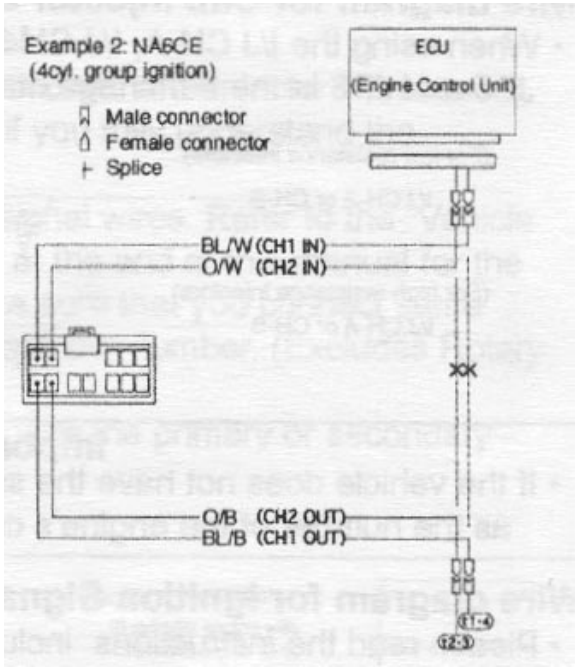


1G ECU Pinout

Connections labeled "T"—Solder do not require cutting the original ECU harness. Just cut back some insulation and splice in the emanage wire. The connections labeled "Connector" require cutting the wire at the ECU harness and crimping the provided Greddy connectors on each end of the cut wire. Then you can plug in the Emanage harness to the ECU. Once the standard installation is complete, tuning can begin. If you are going to install the injection and ignition harness, continue on.

Ignition Harness

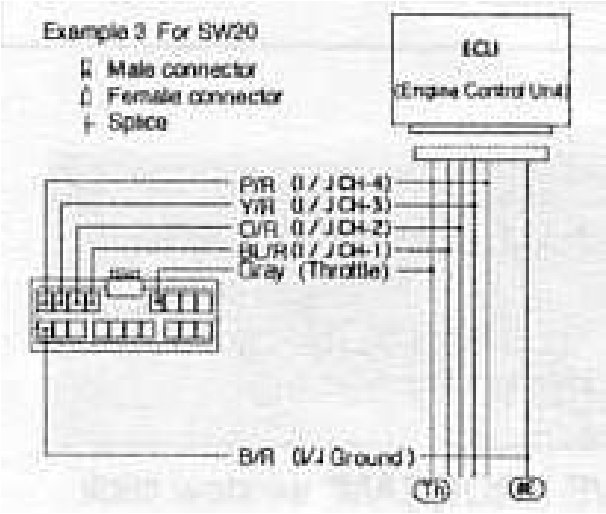
The ignition harness is only 4 wires. The Emanage intercepts the ECUs output to the power transistor which fires the coils. These four wires are the only wires which will populate Connector #2 on the emanage. This harness requires some assembly. Pick the proper color wire and stick the terminal into the connector housing. They will snap into place when properly inserted. You can remove the extra wires from the harness.



Connector #2 Wiring for Ignition Harness

Additional Injection Harness

The injection harness requires 5 wires to be tapped. Do not cut the ECU injector wires, just T in the emanage wires. 1 wire for each injector signal and 1 ground. If you are really cheap and like to sware like a drunken sailor, you can choose to not purchase the injection harness and just use the extra wires from the ignition harness. The catch here is that the terminals don't fit perfectly into connector #1 and you run the risk of damaging the connector housing.



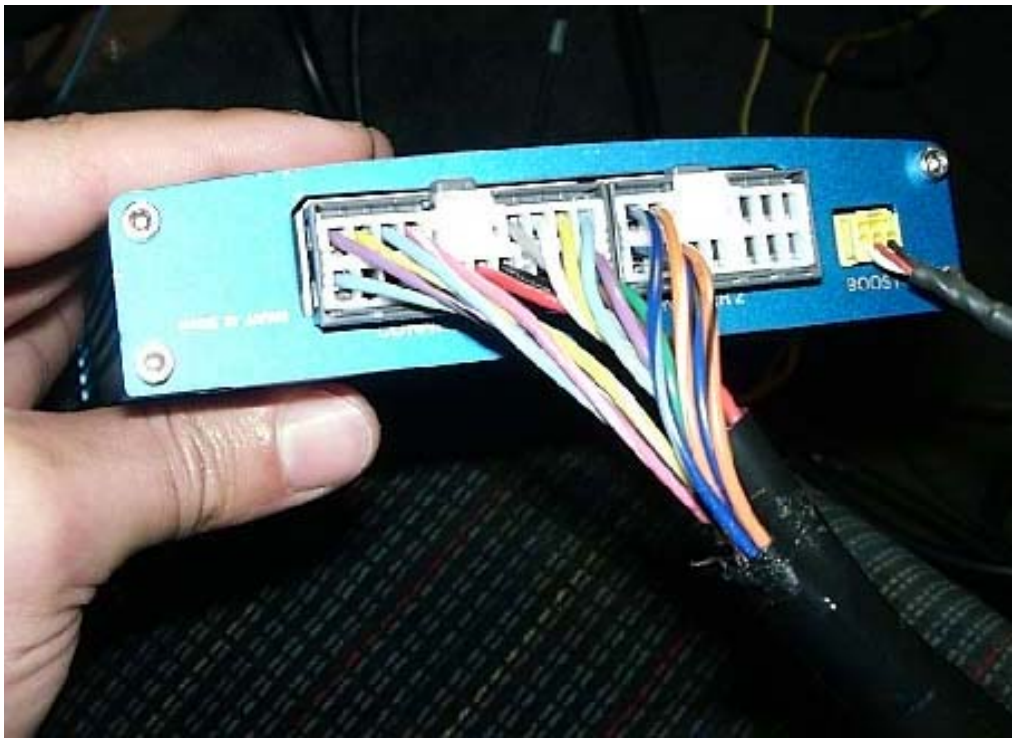
Additional Injection Harness Installation
Connector #1

Boost Pressure Harness

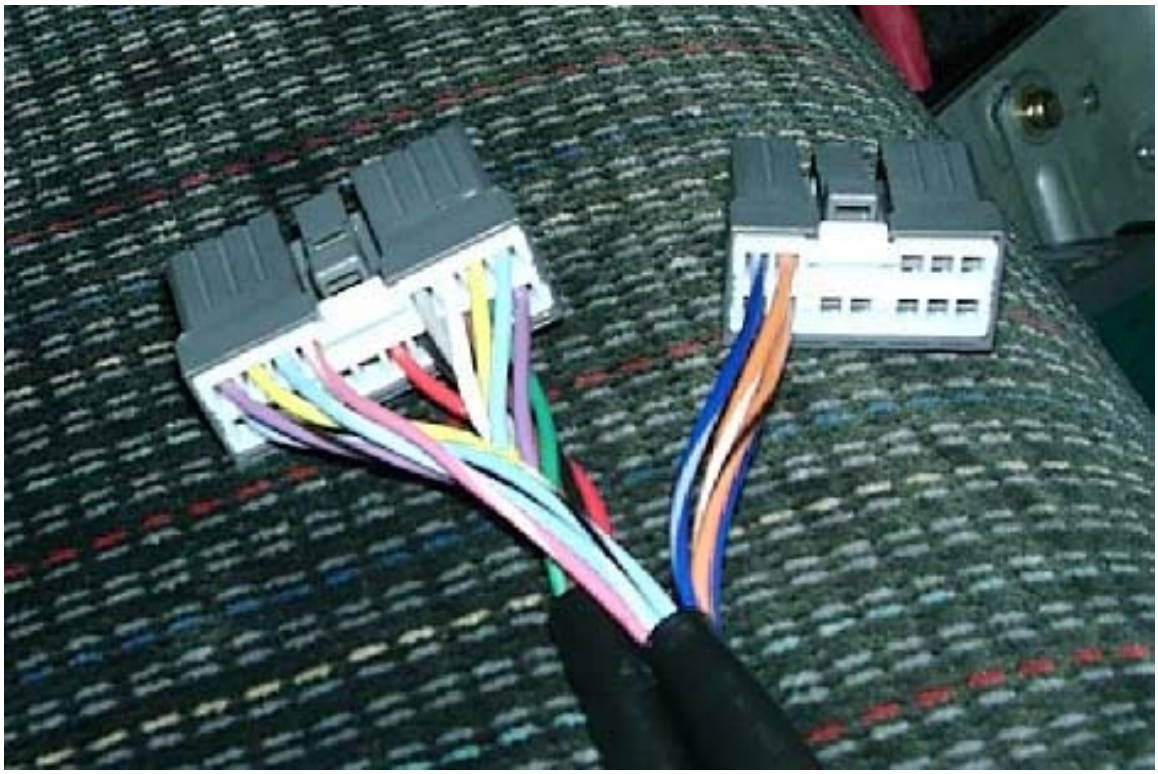
This is as simple as it gets. Just mount the pressure transducer on the firewall, plumb a vacuum line to it, and route the wires through the firewall. **BUT,** don't bother with the boost harness unless you also install the additional injection harness. It does nothing by itself and the Emanage will trip an error code if it sees a boost signal but no injector signals.

That completes the full Greddy Emanage installation. Turn the key to the "ON" position without starting the car and check for the 'active' light to turn green. Start the car and check the emanage for error codes. The 'active' light will flash red if there is a problem. See the manual for info on how to read the error codes.

Pressure Sensor Mounting



Complete wiring harness



Connector #1 and #2

Tuning

Tuning Without Support Tool Software

If you only did the standard installation and don't have the support tool software, use the provided screwdriver-type tool to turn the 5 knobs on the Emanage front panel. The manual refers to these as A.A.V adjustment points and the 5 knobs correspond to 2000, 3000, 4000, 5000, and 6000 rpm. See the manual for more details. Note that the Emanage will not consider the Throttle Position signal unless the support tool is used for tuning.

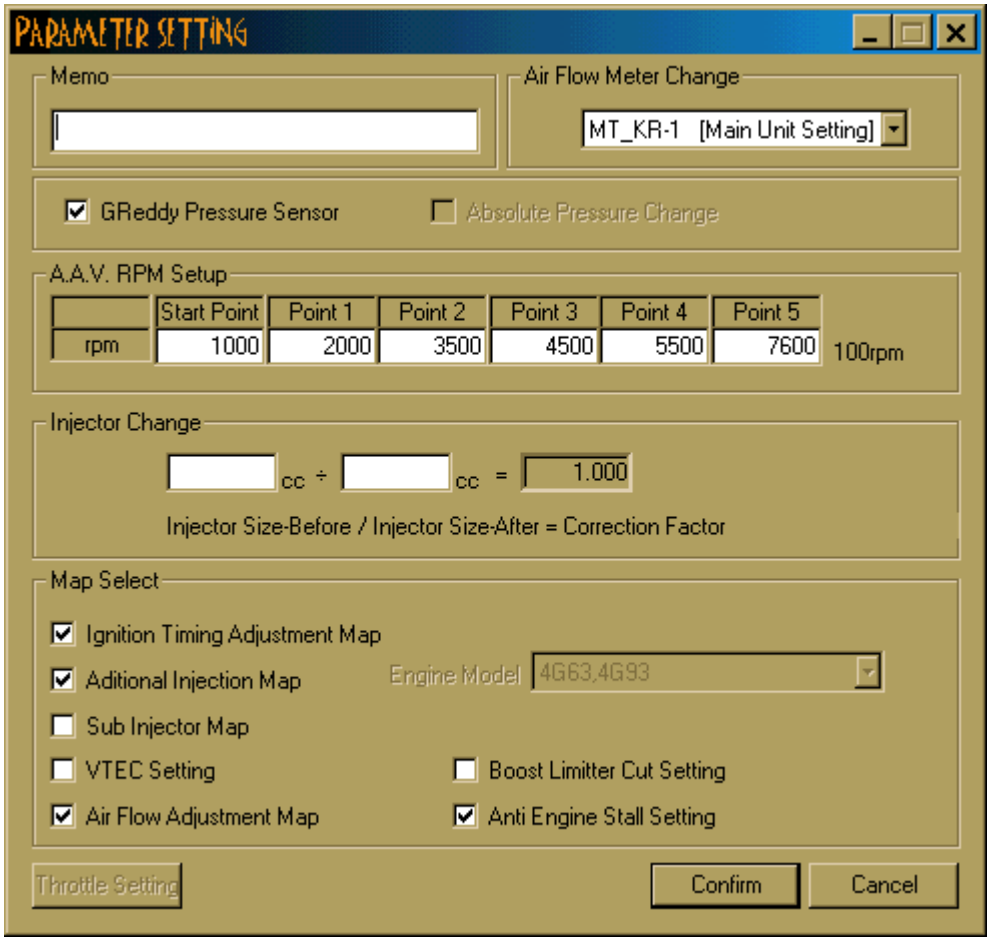
Tuning with the Support Tool

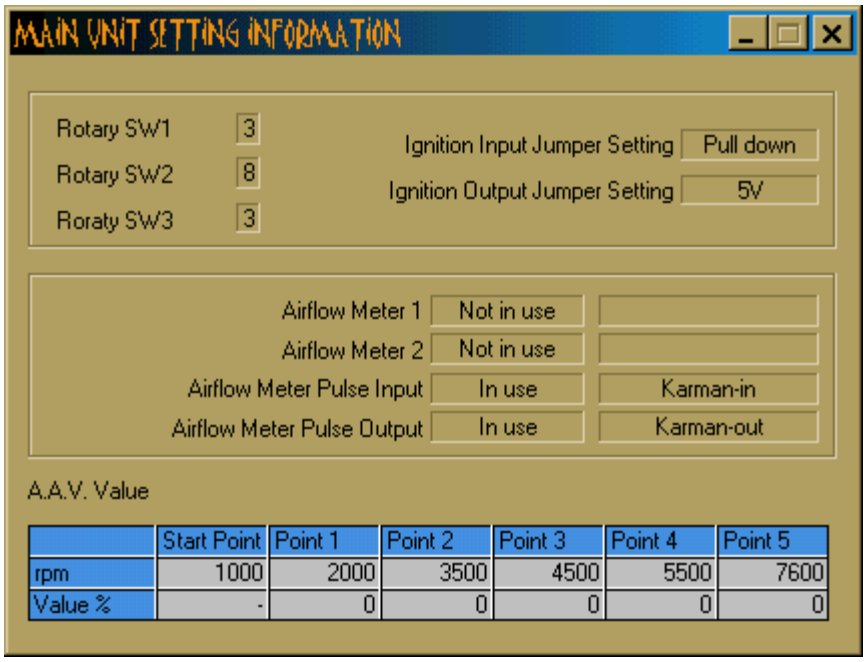
You can check the settings on the main unit with the laptop. Make sure they look like the settings below except for the AAV values. You can set the A.A.V. values however you like under 'parameter setting'. Turn on the maps you wish to use and set any compensation for injector sizes.

Calibrate the throttle position settings under the 'parameter setting' window. Note that if you are using a 1G TMO datalogger, the range of throttle position is from 10%-100%.

The Emanage throttle position goes from 0-100%. Keep this in mind while tuning although it doesn't make too much of a difference.

Emanage TPS value	0	10	20	30	40	50	60	70	80	90	100
TMO TPS value	10	19	28	37	46	55	64	73	82	91	100





Don't get freaked out with the big maps available. With a 16x16 grid, that's 256 numbers you need to input and its easy to get carried away with trying to concentrate on every number. As a first start, enter numbers in blocks. The 'interpolate' feature can be helpful once you figure out how it works. Low throttle and cruise conditions are basically 40% TPS and less. High throttle settings are maybe 70% and higher. Remember to start rich to be safe. The midrange is the toughest to tune. Good luck.

One of the most valuable tuning aids is the "map trace" feature. With a decent laptop (PII or better), the software will highlight which cell of the map you are operating at in real time. This way you can see exactly which cells you need to tune based on what your gauges are telling you and how the car feels. You won't have to guess at what throttle position and RPM you were at when the car stumbled or bogged. You can use a slower laptop but the map tracing will lag.

Miscellaneous Tips

The pressure sensor might seem to be working incorrectly if you use the real time mode or graphing functions to watch its value. It reads extremely low values. There must be a bug in the software. However, you can do the following to prove it is working correctly. Turn on the additional injection map and set the Y axis to Pressure Sensor Voltage. Leave all the map values at zero and watch Map Trace to see that the pressure sensor is working correctly. You should see about 3.4 volts at 1 bar of boost, and 1.75 volts at zero boost and zero vacuum. The sensor is a 3 bar MAP sensor which outputs 0 volts at full vacuum and 5 volts at 2 bar (30 psi).

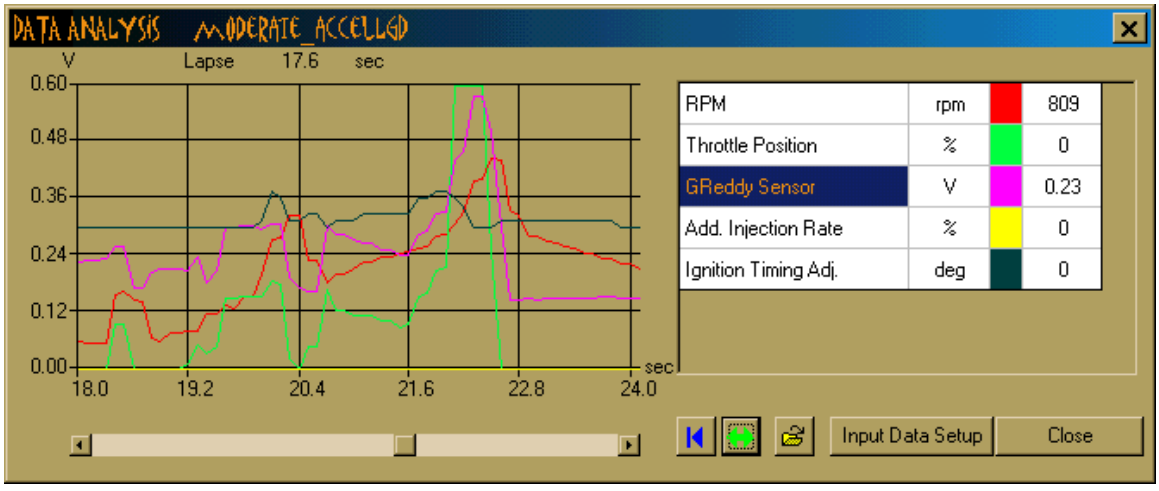
The boost sensor might be helpful in tuning at mid RPM levels at the onset of boost. You can add fuel based on boost in addition to throttle position and RPM to thwart off mid range, mid load knock. With large injectors, the ECU is seeing very little airflow and might not add enough extra fuel to support the engine as the boost is coming up. In some cases, it might even stay in closed loop operation, running extremely lean while the engine is seeing 5-9 psi of boost.

If you are using a 2G MAS on a 1G with 660 injectors, don't enter anything in the injector size compensation. The engine will run pretty good as it is and this way you can enter all negative values in the air/fuel map rather than confusing yourself with some positive and some negative numbers.

If you run race gas occasionally and want a quick and dirty tuning method to adjust between pump gas and the high octane stuff, use the injector size compensation to richen or lean the entire map by whatever percentage you like. Just enter a initial size of 100cc and a final size of, say 105cc, and you will get roughly 5% leaner operation.

If you change some parameter settings or map settings and the engine doesn't seem to change its operation, save the Emanage file and exit the program. Then re-enter the program and import the data to make sure it took the changes you made. I've had some issues changing the injector size and having it not take. I didn't realize this until I re-booted the software.

The graphing feature is a little strange. Click and double-click all over the place in the table to see what you can change. The manual gives a pretty good idea on how this works.



There is quite a bit more functionality that the Emanage can handle. If you are over-running the MAS, you can clip its signal and have the emanage add additional injection based on boost and rpm. For example, perhaps your MAS seems to lose counts past 2100 Hz when you are running over 17 psi at 5500 rpm. You can have the emanage clip the signal at a maximum value of 2000 HZ. Then program extra injector duty cycle in the

Injection map for 5500 rpm and up based on boost. Tuning it right may be a bit tricky. I haven't tried this yet. The values mentioned above are for illustration purposes only. Don't Roy your motor and come looking at me.