

882 ECU SOFTWARE OPERATING MANUAL

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*****Note, for ignition, fuel and idle control mapping techniques, see the 034EFI Tuning Manual*****

Section 2

TECHNICAL TERMS GLOSSARY:

Open Loop: Using an engine controller **without** the use of a feedback device such as an EGO sensor. This mode of operation is typically used in non-emissions applications, or used during the tuning for the controller to maximize its open loop calibration accuracy.

Closed Loop: Using an engine controller **with** the use of a feedback device such as an EGO sensor. This mode of operation is typically best for emissions and for best fuel economy, but often not used for making peak engine power.

EGO: Sometime known as “O2” sensor, this sensor is used to determine the current lean/rich state of the engine, and used as an element in closed loop operation.

TPS: The throttle position sensor, actually an electronic potentiometer connected to the throttle shaft. Often used for fast throttle response and for idle mixture stabilization.

CLT: Sensor used to measure the coolant temperature. Actually a NTC thermister. (Negative Temp. Coefficient)

MAT: Sensor used to measure the manifold air temperature. Actually a NTC thermister.

AUX: Auxiliary voltage input. Used as a general purpose mapping input where anything that can output a voltage can effectively alter the controller behavior.

IAC: “Idle Air Control”, a GM style stepper motor that can be used to control idle speed.

Controller: Also ECU or Engine Control Unit. Electronic device that takes sensory input, and in turn controls the engine operation.

Mapping: The process of setting gain parameters across a wide operating range in the engine controller, that results in a favorable operation of both engine and controller.

Ignition Timing: The actual timed event of ignition, which begins the process of combustion. All gasoline engines use a set amount of timing advance, where the spark plug is energized at some point before the piston is at “TDC”.

Gain: Arbitrary unit of measure to describe a scaler or linear increase in output as a function of a given input. The mapping operations and maps are made up of matrices of gain cells, which are changed to promote proper engine operation.

ECU: Engine Control Unit, also Controller. Electronic device that takes sensory input, and in turn controls the engine operation.

Pulse Width: The length in time (typically milliseconds) that an injector is driven for in relation to the current needs of the engine.

Duty Cycle: The ratio of time that an injector is on or opened in relation to the time it is off. It is never desirable to run fuel injectors to duty cycles beyond 90%, or the injectors may overheat, or the engine will suffer a lean-out condition, and suffer serious engine damage. Always size your fuel injectors so that they provide between 120% and 150% the amount of fuel horsepower needed by your engine.

Section 3

GETTING STARTED

PC REQUIREMENTS

The ECU system programming software [ECU.EXE] has the following Hardware/Software Requirements in order to operate correctly:

- A) IBM PC Compatible using a Pentium 90mhz processor or better.
- B) A 32 bit Operating system, [WINDOW 95 OSR 2.0 or greater, WINDOWS 98, NT v3.51+, Millennium Edition, 2000 and XP]. Note: Windows 95 Revision 4.00.00A may require some additional files to operate correctly...
- C) At least 4MB of CPU RAM.
- D) At Least 4MB available Hard Disk storage.
- E) 9 pin serial [RS 232] port.
- F) 16550 or compatible UART [one that has at least 16 bytes FIFO memory].
- G) 1024 x 768 VGA graphics mode, 800x600 screen resolution minimum.

SOFTWARE INSTALLATION

Your dealer will provide you with a CD-ROM installation disk, simply insert the CD-ROM into the computer and double click SETUP, simply follow the instructions from there. Typically the software will be installed in the PROGRAM FILES folder on the C DRIVE in a folder named ECU882. Future ECU882.exe update files should be copied and run out of the directory where the software is installed.

RUNNING THE SOFTWARE

Execute the Start icon in the lower left-hand corner of your computer screen. Click on the "Programs" icon from the Start menu. Find the name of the program package [ECU 882 is the default], and click the ECU icon. The program should run without any errors, if not, contact technical support.

Section 4

ECU SYSTEM CONSOLE

The first thing that you should see after running the ECU program is the ECU system console. The ECU System console allows the user to traverse quickly between different functional screens, so that the system can be monitored and programmed as quickly and efficiently as possible. Since laptop computers typically have poor visibility and poor mouse control, it is advised to use menu commands instead of buttons, although the
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functions are identical. No communications takes place while the ECU System Console is visible, so it is possible to leave the computer in this mode while the ECU engine controller is not powered/OFF. The ECU System Console is provided to ALL users, who have purchased the ECU Engine controller, but all programming features require a purchased license to operate.

SETTING COMMUNICATIONS PORT

The programming software "ECU-882-x.EXE" communicates with the engine controller through a medium speed RS-232 link between your computer and the engine controller. In order to communicate, the engine controller must be properly installed/wired, and power must be provided to the engine controller. Power is usually provided by turning the ignition switch ON. When the engine controller power is turned off, or falls below 5.7 VDC, communications will halt, as will engine control. The Programming software needs to know which communications "COMM" port that it must use to communicate with the engine controller. The default is COMM 1, as this is typically the available port on most laptop computer systems. If COMM 1 is not available, another COMM port must be selected. If another COMM port is selected, you must totally exit the program before the selection can be used.

Section 5

REAL TIME MONITOR:

This feature is ideal for monitoring the data channels on the engine controller, to look for sensor failure, or to monitor performance. All internal sensors can be monitored from this screen.

DASHBOARD:

This feature is a graphical representation of many of the sensor-based inputs to the engine controller. It is a great way to get a relative feel for the sensory information instead of plain numerical information.

CONFIGURATION:

This feature is used to setup the basics of engine control. This feature effects the heart of the engine controller, and most other programming screens are dependent upon data that is entered in the Configuration screen, to be correct and appropriate.

BASIC MAPPING:

This feature allows the engines specific operation to be characterized so that the engine operates as needed across the entire engine map. It incorporates a 16x16 2-dimensional table that allows the user to compensate for engine volumetric efficiency as well as other issues that make simple non-mapped systems inappropriate for many engine applications. This interface allows for subtle changes to be put into a specific engine setup to allow for minor to major engine modifications, while still giving great driveability and performance. A "Crosshair" graphical device is provided to show the user where the controlled engine is currently operating, thus making the mapping operation easier.

ADDITIONAL MAPPING:

This feature is used to setup a series of sensor based fuel enrichment and timing maps, as well as setting up the closed loop set-point map. A "Crosshair" graphical device is provided for each of the map entries for this feature, to make programming the maps a simple operation.

GPO DRIVERS:

“General Purpose Outputs” - This feature is provided to setup the 4 optional PWM Outputs. A "Crosshair" graphical device is provided for the map to make programming a simple operation. Since the GPO's are PWM outputs, they can be used to control many different types of frequency valves, solenoids, and relays. Some common uses are fuel pump relay, cooling fans, Nitrous activation, Water Injection, Boost Control, Etc.

Section 6

DATA PLOTTER:

This feature allows the sensor data to be plotted on a digital chart recorder. Individual sensor channels can be turned off and on, the plotter interval time can be changed, and plotted data can be logged into a file that can be imported into any spreadsheet package.

ABOUT ECU:

This feature allows a quick verification of the controller's serial number, the software revision number and the controllers internal firmware revision. This information is provided for troubleshooting purposes, or to allow the user to get the serial number so that a software license can be obtained. This feature also provides contact information for obtaining service or technical support.

EXIT:

Allows user to exit the console application (ECU-882-x.EXE).

Section 7

LICENCING: Currently no additional licensing is required within the Stage that is originally purchased. For example, when the Stage 882b system is purchased, the full version will be provided. Additional cost would only be required if an upgrade to 882C was desired.

Section 8

If the provided user license code were 255-255-255, the user would enter the following information into the license entry screen. If additional engine controllers are to be used from the same PC, a separate license will be needed for each ECU, and the correct license code for the specific ECU will have to be entered before attempting use the software. If ever a license code is required, 255-255-255 should be used.

Section 9

REAL TIME MONITOR:

The real Time Monitor allows the user to view the operation of the controller while the controller is operating. This allows the user to gauge the level of tuning required, and to troubleshoot the system after installation or if a problem arises later. The monitor also

allows the tuner to view the results of different tuning parameter changes and is an important feature in viewing any of the ECU resultant output calculations.

Section 10

DASHBOARD:

This is another monitor only feature that allows a graphical representation of the engine tachometer, air and coolant temperature sensors, battery voltage and manifold pressure. Also provided is a simulated LED Lambda meter for monitoring the air fuel mixture. The dashboard screen also provides the user the ability to adjust the High Range and Low Range fuel parameters, which will allow course tuning of the main fuel parameters from within this screen. Also provided is the ability to temporarily turn off or on closed loop operation, which allows the user to set fuel and mapping parameters without having to deal with the engine controller trying to correct the mixture that the user is setting. The user may also monitor the EGO correction gain, which can tell the user if the mapping parameters are set well. Note: A well mapped engine should have EGO correction gain figures close to 1.000 across the portions of the map that it has been tuned for. A timing offset can be entered in this screen to correct any timing error between what the ECU is calculating and what the engine is actually showing. In order to do this, set the base ECU timing to zero by activating the “ Set Timing to 0d for verification” field, by measuring the actual timing of the engine the error can be determined.

[High Range Adj]

This is the main fuel parameter across the entire map. Increasing this parameter will cause a richer mixture.

[Low Range Adj]

This is the fuel-offset parameter, and adds or subtracts from the calculated injection pulse width.

[Timing Offset]

A timing offset can be entered in this screen to correct any timing error between what the ECU is calculating and what the engine is actually showing.

[Set Timing to 0d for verification]

Clicking this sets engine timing to 0 for verification from actual engine timing.

Tachometer Filtering – The feature from the options menu allows different levels of electrical filtering for the tachometer circuit.

NOTE: Clicking the check mark will store this screens parameters to the ECU memory.

Section 11

CONFIGURATION

Acceleration Based Enrichments

[Accel Sensitivity]

Sets the amount of throttle opening enrichment. Higher numbers gives more fuel when the throttle is opened rapidly. Use values of 10.0 or greater

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[Accel Rate]

Sets the length of time that the acceleration enrichment will operate. Lower numbers will give longer enrichment times. Use values of 5.0 or greater.

[Accel Min PW]

Sets the minimum calculated acceleration pulse width that will be used. This prevents small throttle changes from causing unwanted enrichments. Larger numbers will give lower emissions, but poorer response.

[Accel Max PW]

Sets a limit on the amount of acceleration enrichment that can be used. Larger numbers will allow higher enrichments.

[Accel EGO Reset]

Sets the amount of enrichment that will disable then reset the closed loop (EGO) operation. Lower numbers will reset the EGO algorithm and prevent closed loop operation during transients. Setting this value too low can cause problems with normal or static closed loop operation.

Timing Configuration/Engine Setup

[Rev Limiter1]

The RPM at which ignition timing retard is activated, when Aux. Input voltage is below 1.67v, used for Launch Control and Turbo Anti-Lag. The default rev-limiter value, set Rev Limiter 2 to the same RPM if other functions are not being used.

[Rev Limiter2]

The RPM at which coil and fuel cut will be activated when Aux. Input voltage is above 1.67v, used for protection of the engine.

[Engine Decel]

The Vacuum/Pressure at which the fuel will be cut during engine deceleration. Usually set to 20-25 kPa.

[Crank Wheel Teeth]

Enter the number of teeth for the crank speed and position reference, currently only 60 teeth are compatible.

[Index Teeth Until TDC]

The number of teeth between the 2 missing teeth and actual engine TDC. The 2 missing teeth always should occur before TDC and in a range of 10-20 teeth.

[TDC Trim Advance]

This function can be used to add or subtract timing to compensate for any variation between calculated and actual engine ignition timing.

[Coil Dwell Time]

This function determines the coil dwell or firing time, values over 4->MS should be avoided to prevent coil damage.

[Min. Dwell Time]

The minimum firing time of the coils in degrees, thus the time of coil firing will be reduced as engine RPM are increased.

[Tach Full Scale [RPM]]

This is the max range for which to calculate and display engine RPM.

Requires that the Number of Cylinders be set correctly, and that each cylinder receives a trigger every 720 engine degrees.

[Engine Phases]

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Up to 12 engine phases can be created for ignition and injection events. A typical engine will use one phase per cylinder, but virtual phases can be created as well to meet a number of needs.

[Base Degree Fields]

The degree point at which each phase event is determined by this field, typically Phase 1 will correspond to 0 degrees, and each consecutive phase will reflect a value to complete 720 degrees. For example, a 4-cylinder engine would have the values of 0d for Phase 1, 180 for Phase 2, 360 for Phase 3 and 520 for Phase 4.

[Driver Tach Check Fields]

If more Phases are used than cylinders, then the Tach Check Fields should be used to apply the proper # of Phases to the Tach calculation to ensure proper RPM readings.

[Ignition Driver Number Check Fields]

Each phase can be configured to fire a certain driver based on the engine firing order.

Battery Voltage Compensation

[Battery Voltage Compensation]

This value allows injection time to be influenced by battery voltage.

Controller Power up Priming Parameters

[Cold Priming Duration]

Sets the pulse width given to a cold engine when the ignition is turned on. Will not function unless ECU is powered by an ignition switched source.

[Cold Number of Pulses]

Sets the number of pulses given to a cold engine when the ignition is turned on.

[Hot Priming Duration]

Sets the pulse width given to a hot engine when the ignition is turned on.

[Hot Number of Pulses]

Sets the number of pulses given to a hot engine when the ignition is turned on.

[Cold/Hot Threshold]

The Air temperature in degrees, that differentiates a cold versus hot priming event.

Closed Loop EGO Parameters

[EGO Loop Rate]

The rate at which the EGO algorithm is applied for closed loop operation. Sometimes known as Integral Gain. Higher numbers cause slower, but more stable closed loop operation.

[EGO Prop. Gain]

Sets the instantaneous fuel correction from the EGO sensor. Setting this too high causes rapid lean/rich oscillations. Setting this too low can cause higher emissions, and slow closed loop response time.

[EGO Loop Activation]

Sets the number of seconds after power up before the EGO sensor is used for closed loop operation. Set to 0 for no EGO/closed loop operation or a long enough period that the EGO sensor is heated to its required temperature. Also set to zero during fuel parameter

changes and mapping to eliminate the closed loop operation from altering the parameters that you are setting.

[Min EGO Gain]

Lower limit that the closed loop operation can set the gain to a lower authority limit.

[Max EGO Gain]

Upper limit that the closed loop operation can set the gain to a higher authority limit.

Other Options

[TPS/MAP mapping]

Sets if the internal MAP sensor or the TPS becomes the “Y “ axis entry into the basic map matrix.

Idle Speed Control Parameters

[On Init Close] The IAC will close this many steps on startup. This value should be more than the After Init Open parameter. Should also be less than 250 because the IAC stepper only seems to have 200 to 300 total steps from closed to open. This parameter ensures the IAC is fully closed upon startup and gives a repeatable reference point for the IAC to work off of.

[After Init Open] This is the target IAC position to start the car. The IAC will open this many steps. This will depend on your throttle stop setting, the lower the throttle-stop-idle setting you have the more steps will need to be opened to enable the proper idle speed.

[Enable if TPS Below] The IAC is only adjusted when the throttle is closed. It detects that the throttle is closed when the TPS value is less than this parameter.

[Close if TPS is Above] The IAC will quickly and automatically close if the TPS goes above this value. This will keep ensure from loosing boost out of the IAC. When the TPS drops below the “Enable if TPS Below” value, the IAC will reopen to the “After Init Open” position, and idle will resume.

[Max Step Rate] This sets the speed at which the IAC is stepped when during Init, and sets the max rate that it will ever be allowed to step.

[Rate at 1K error] This sets the speed that the stepper will move as a function of the error between the actual engine speed, and the speed set point table in Additional Mapping.

[Control Deadband] This sets the minimum error in RPM that must exist in order for adjustment to be performed. Setting it to 50 with a RPM set point of 1000 would disable IAC corrections from 950 to 1050 RPM.

NOTE: Clicking the check mark will store this screen’s parameters to the ECU memory.

Section 12

BASIC MAPPING

[TPS MAP cut-in RPM]

Sets the minimum RPM that the %TPS mix mapping will be used. For instance by setting this feature to 300 RPM, the engine controller will use ONLY the normal mapping parameters from 0 to 300 RPM. This feature is useful for allowing proper starting injection pulse widths, will allowing a sharp transition to a mixed TPS stabilized injection pulse width.

[Injector Main Adjustment [MS]]

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This is the main fuel parameter, similar to the function of main jets on a carbureted engine. This number equates to the basic “unmapped” pulse width that the controller would calculate at the maximum manifold pressure. Increasing this number will generally give more fuel at a give pressure/engine load. Be careful to correctly select your fuel injector rates, as if the injection pulse width gets too long, the injectors can be opened for 100% of their duty, at which point the engine will lean out, and likely become damaged. For more information of injector selection, please call or email technical support.

[Injector Idle Adjustment [MS]]

This parameter is usually considered a trim adjustment, similar to the idle and progression circuit in a carbureted engine. This parameter is typically near zero, or even slightly negative in many medium performance applications. In higher performance applications, where the idle manifold vacuum is low, this parameter can be somewhat more negative, where the calculated pulse width at idle is too high due to higher manifold pressure (poor vacuum). The negative Injector Offset parameter subtracts “if negative” from the basic pulse width so that the resultant pulse width is what is needed to control the engine.

[Basic Mapping Matrix]

In the middle of this screen is a 16 by 16 matrix of cells, These cells form the basis for setting the mapping gains at various locations in the engines operation. The default values for the entire matrix “map” is 1.00, which signifies that the Injector Main and Idle Adjustments ONLY are used to set the basic injection pulse width calculation. By setting a given cell or range of cells to different values other than 1.00, the engine operation across the region of the map can be made richer “more fuel” or leaner “less fuel” in order to make the engine run and operate properly. Values in these field greater than 1.00 signify more fuel to be used in this cell, and values less than 1.00 signify a need for less fuel in this cell. As the RPM or pressure moves between cells, an interpolated mapping gain is calculated between this cell and the next cell up and next cell to the right. In this way value differences between cells are smoothed out as the engine accelerates across a cell, and into the adjacent cell. In general, simple engines “engines with no or light modifications” require little or no mapping from the default matrix of 1.00 values. Larger engine modifications and higher performance engines may require substantial mapping changes in order to obtain suitable operation. Mapping an engine can be a very tricky task, if this is your first time, take it slowly and change only 1 thing at a time, and make small sensible changes. You may also consider having a professional assist you in this task to establish a reasonable running engine that can be fine-tuned by you later.

[TPS PW]

These parameters set the desired pulse width from this cell TPS position to the next cell TPS position. This acts as the TPS independent contribution to the pulse width calculation. The TPS PW series of cells forms a 2 dimensional pulse width curve that can be mixed into the normal pulse width calculations. These parameters along with the %TPS MIX parameters can assist in stabilizing the idle and light load pulse widths in heavily cam'd or with very low volume induction systems. Reducing the parameters in these fields will reduce the TPS based contribution to the pulse width when the %TPS MIX values are not zero. PW values should rise from small (below 1) to no more than 5 or 6 (typically). Values bigger than this will cause excessive enrichment in low-rpm, large throttle opening conditions.

[%TPS Mix]

These parameters set the amount of mixture between the normal mapping based pulse width, and the TPS based contribution. The %TPS Mix parameters allows a tapered mix function based upon engine RPM, where the engine can transition from a higher TPS based mixture at low RPMs to a lower or even zero TPS based mixture at higher RPMs. This feature allows a controlled transfer from a primarily throttle based idle, to a pressure based control at higher RPMs, where perhaps the volumetric efficiency is better, or manifold pressure stabilizes. Setting these parameters to zero will fully disable (default) the TPS based mixture, and numbers up to 100% will run primarily off of the throttle position sensor. Values should taper to close to zero at large throttle openings.

Cur Lamda is the output of the EGO sensor expressed as Lamda, where numbers less than 1.00 mean rich, and numbers greater than 1.00 mean lean. This value can be used (if EGO sensor equipped) for tuning the fuel parameters and mapping.

Map Enr is the current calculated gain from the mapping matrix. This useful to see the effect of your mapping values while the engine is operating.

EGO Corr is the current gain established by the closed loop operation using the EGO sensor. If the controller is not running closed loop, this value should be 1.00. If the number is not 1.00 then the controller has altered the closed loop gain to attempt to maintain a desired air fuel mixture. If the number doesn't usually stay between .90 and 1.1, then this indicates that the engine is not properly mapped open loop, and than the closed loop operation has taken unusual means to correct the tuning problem.

INJ PW is the final current calculated pulse width that the injectors will use.

Crosshairs indicate the current operating points within each of the maps.

Clicking the check mark will store this screens parameters to the ECU memory.

Section 13

ADDITIONAL MAPPING

[CLT Enrichment]

This series of cells forms the gain as a function of coolant temperature. This allows more or less fuel to be used at different temperature sort of like a "choke" function on carbureted engines. Higher values will yield more fuel across this temperature range.

[MAT Enrichment]

This series of cells forms the gain as a function of manifold air temperature. This allows more or less fuel to be used at different air densities. This is most useful across wider air temperature ranges, or when using a blower or compressor to compensate for compressive air heating. Higher values will yield more fuel across this temperature range.

[MAP Ignition Advance]

This series of cells allows timing advance or retard based on Manifold Pressure, and should be used to map ignition for load conditions.

[RPM Ignition Advance]

This series of cells allows timing advance and retard based on RPM, and should be used to create the basic timing map or "curve".

[MAT Ignition Advance]

This series of cells allows timing advance or retard based on air temp.

[Barometric Compensatory]

This series of cells allows the adjustment of fueling based on barometric pressure, and uses the second, 1BAR MAP sensor contained in the ECU.

[Idle Speed Setting]

This series of cells sets the target idle speed setting based on temp.

[AUX Enrichment]

This series of cells forms the gain as a function of an external input voltage. Higher values will yield more fuel across this voltage range.

[EGO Lamda Setpoint]

This matrix forms an RPM vs. MAP pressure closed loop Lamda setpoint map. Setting these values lower than 1.00 will yield a richer closed loop operation, and values greater than 1.00 will yield leaner closed loop operation. Don't move these values too far from 1.00 or stability problems will arise due to the rather narrow band of useful range that an EGO sensor can be used.

Crosshairs indicate the current operating points within each of the maps.

Clicking the check mark will store this screens parameters to the ECU memory.

Section 14

GPO MAPPING

[GPO Parameters]

This feature allows the user to choose one of the 4 GPO outputs to configure.

[GPO Parameters Matrix]

This 9 x 9 field allows mapping of the GPO based on different X and Y-axis input sources, which can be chosen for each field. The matrix fields can be manipulated with a 0-100% value.

[Mapping Input Source]

This allows the selection of the MAP, TPS, RPM, AUX input or none of the above to become the basis for the supplemental driver map. Clicking any of these signals will automatically alter the range of the mapping cells. Use this feature to control supplemental fuel driver, EGR solenoids, Boost Control, Nitrous Control, Water Injection, and even idle air solenoids for whatever purpose seems appropriate.

Section 15

DATA PLOTTER

The Data Plotter is a tool to monitor performance trends and to plot or log sensor data into a spreadsheet file for later evaluation. Each of 6 listed sensory inputs may be selected or deselected of the graph. The plotter file name allows the user to type in the name of a file that this program will log to each log interval. Keep the file extension “.CSV” so that any spreadsheet program can successfully import the data from this feature. Clicking the Logging Interval menu item will allow the user to select a logging interval from 100ms per log entry to 10 seconds per log entry depending on how often the log needs to be

performed. **Note that faster logging intervals may not be accurate on older or slower computers.** To start a log, enter the desire logging filename, set the desire logging interval, then click “**START LOG**”. To stop the started log, click “**STOP LOG**”. The log file will the then name that was specified, and will be stored in the 882 installation sub-directory.

Section 16

ABOUT ECU:

This screen gives the user our company information. This screen also allows the user to find out what version of ECU software is installed, and what version of firmware is installed in the engine controller, and the serial number of their specific ECU. If technical support is needed on either the ECU System Console, or the engine controller, please reference the two printed revisions and have that information available for technical support. Clicking **EXIT** will return to the system console.

Section 17

SAVING/RESTORING CONFIGURATION DATA:

The internal control parameters may be stored to a file on the PC, as well as a configuration file may be restored to the controller. This feature allows the user to create a benchmark, or a reference configuration that can be reverted to in the event that programming proves to have done more harm than good. To access these features use the File, Upload/Download menu. If the user is happy with a given configuration stored within the engine controller, or if the user wishes to save a reference "snapshot" of the data in the engine controller, the entire controller data-set can be stored off to a calibration file on the PC. The file may then be read, and restored into the engine controller at a later time. This can be useful to maintain a set of configurations that go with different engine modifications, or even different engines.

To save a configuration to a calibration file:

From the ECU System Console, click "File", then "Download ECU to calibration file". A dialog box will ask you to enter a filename. Enter a filename, and click "Save".

To restore a controller configuration from a calibration file:

From the ECU System Console, click "File", then "Upload calibration file to ECU". A dialog box will ask you to enter a filename. Select the file of your choice, then click "Open". While tuning an engine (particularly when the user experience level is low), it is recommended that the user save a reference calibration file so that if something really gets messed up in the calibration. The user can revert to a calibration that operates properly. This serves as an “undo” to a major oops.

Enjoy tuning your 882 ECU!