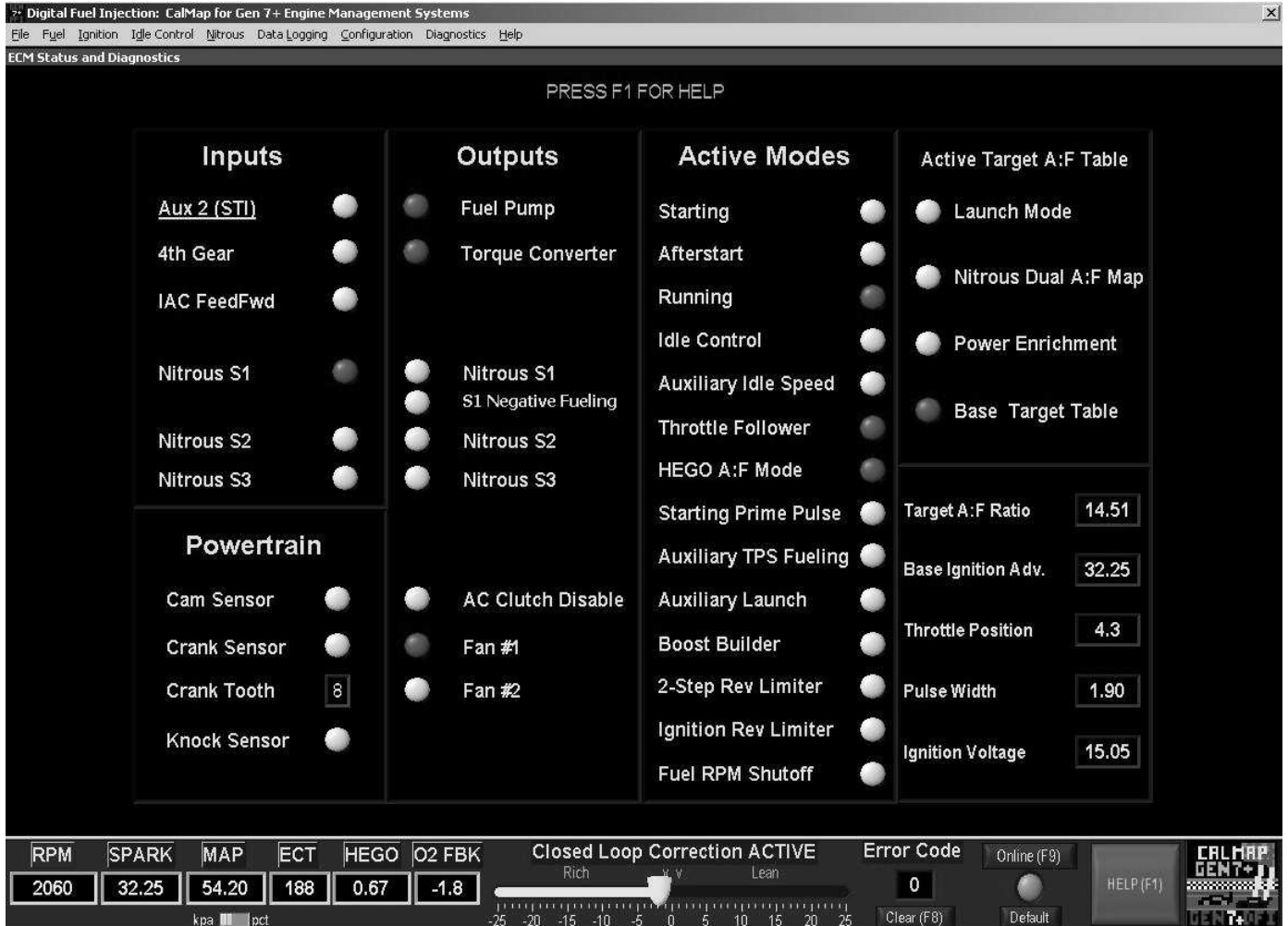


# ACCEL/DFI Generation 7+ Version 4.0 Upgrade Features



THE FOLLOWING CHANGES CORRESPOND TO CALMAP SOFTWARE VERSIONS 4.0 AND HIGHER, AND ACCEL/DFI GENERATION 7+ ENGINE CONTROL MODULES WITH FIRMWARE REVISIONS OF 4.0 AND HIGHER.

IF YOU HAVE A GEN. 7 ECM WITH A FIRMWARE REVISION OF 3.2 OR LOWER AND WISH TO UPGRADE CONTACT YOUR LOCAL EMIC DEALER FOR DETAILS.

A DEALER LISTING IS LOCATED ON THE WEB AT (<http://mrgasket.com/>). CLICK ON THE ACCEL/DFI LOGO LOCATED AT THE BOTTOM OF THE HOME PAGE.

WHEN USING AN OLDER CALIBRATION WITH A NEW OR UPGRADED MODULE, YOU MUST VERIFY THAT THE FOLLOWING NEW FEATURES ARE PROPERLY CONFIGURED FOR YOUR APPLICATION.

WHEN INSTALLING CALMAP VERSION 4.0, YOU WILL HAVE TO MANUALLY COPY ANY EXISTING CALIBRATION FILES FROM YOUR OLDER CALMAP DIRECTORY INTO THE NEW CALMAP GEN 7+ VERSION 4.0 INSTALLATION DIRECTORY.

## **Data Logging**

- The Data Logging system is now configurable in real time. Configuration is done from the same screen as data recording, accessible via the F5 key. Variable names are in drop down lists for all available logging channels. Continuous monitoring is available, the graph can now scroll across the screen whether data is being recorded or not. New "Options" button added for changing sample rate, trigger values...etc. Record button replaces "Trigger" button, and pressing the Space Bar will automatically begin recording.

CalMap Location: F5 Shortcut Key, or Data Logging Menu ->Run->Configure and Run

- Data Logging Analysis has also been improved. After displaying a log file, right clicking with the mouse on the graph will bring up a menu with data display/manipulation options. Options are now available for selecting a new starting and ending points, as well as comparing log files, and renaming data sets.

CalMap Location: CTRL-G Shortcut Keys, or Data Logging Menu -> Analyze -> Graph Session.

## **Nitrous Oxide Injection System**

- New high-resolution 16x16 Ignition Trim maps. This allows calibration of timing vs. boost to blend power more effectively in each stage when used in a blown application. There is a separate Ignition Retard map for each of the 3 stages of nitrous oxide injection.
- Shutdown timers for each stage. If enabled, these timers will shut off the given nitrous stage upon elapsing. Programmable 0-16 seconds. This allows very elaborate usage of the Nitrous system outputs for precisely timed control nitrous oxide injection, or various engine accessories such as boost controllers, fuel pumps, external data loggers, and more.

- Individual Engine Speed Limits for each stage. Each individual stage of Nitrous Oxide Injection can now be shut down at a given engine RPM, independent of all other stages.
- No Nitrous activation while 2-Step active. An option to disallow entry into an active Nitrous injection stage while the 2-step rev limit input is active has been added via a configuration switch on the NOS screens. One setting applies to all stages of nitrous oxide injection.
- Negative Nitrous Stage 1 Fueling. A configuration bit has been added to the Stage 1 Nitrous Configuration Screen which can cause the ECM to subtract the calculated Nitrous enrichment from the cumulative Fuel Mass value. This can be useful as a way to make gross fueling adjustments outside of the Volumetric Efficiency calculations when additional fueling sources are introduced into the engine.

CalMap Location: Nitrous Menu-> (Stage N) -> Configuration

## **Ignition Barometric Compensation**

Increased the size of the Ignition Barometric Pressure Compensation table from 1x16 to 16x16 cells. ECM can now provide Barometric Pressure as a monitor variable. The barometric pressure axis of the table is now scalable, allowing for better resolution in the areas that a particular vehicle will see usage.

CalMap Location: Ignition Menu -> Steady State -> Atmospheric Compensation

## **Wideband O2 Sensor Feedback Limits**

Separated positive and negative O2 feedback limiting values into 2 distinct tables. Note that the data from the old Wideband O2 Correction Limit table WILL NOT be imported into the new tables. When using an older calibration file in a version 4.0 or higher ECM, you must program both of the new O2 Feedback Limit tables.

CalMap Location: CTRL-U Shortcut Keys, or Configuration Menu -> Fuel

## **STI Alarm Input Functionality**

The function of the Self-Test Input has been changed. It can now be used as a programmable alarm input that generates error code 73 when a ground is applied. Fuel delivery and EST signals can optionally be shut off when this input becomes active, after a programmable delay time of 0-16 seconds. The most commonly used triggers are Fuel and Oil Pressure, Water Temperature, and Brake Pressure. The Malfunction Indicator Lamp output behavior is also

changed. If engine RPM > 0, and an error code is generated, the MIL output will be activated constantly, as before. However, when engine RPM = 0, the MIL output now flashes error codes as if the STI input were activated.

CalMap Location: CTRL-C Shortcut Keys, or Configuration Menu -> Controls

## **GM LS1 and LS6 Ignition System Compatibility**

Released September 2003, Gen 7+ kit for GM LS1 and LS6 platforms uses stock cam/crank signals, and stock ignition coils.

CalMap Location: CTRL-S Shortcut Keys, or Configuration Menu -> System

## **Hardware Input Debounce Delay (Professional Version Only)**

Added programmable table to determine how long a hardware input line must stay in an active state until the ECM recognizes it to be active.

CalMap Location: CTRL-N Shortcut Keys, or Configuration Menu -> Sensors

## **HEGO Air-to-Fuel Ratio Mode**

Implemented the ability to estimate an actual air-to-fuel ratio from a HEGO sensor voltage. Closed loop fueling can now be controlled around a given air-to-fuel ratio, as compared with the voltage input measured from the HEGO sensor. RPM and MAP threshold controls allow operation above a given Engine Speed, and below a given Manifold Pressure. This will offer better air-to-fuel ratio targeting, and increased fuel efficiency.

CalMap Location: CTRL-C Shortcut Keys, or Configuration Menu -> Controls

## **Wideband Oxygen Sensor Selector**

A new feature to has been added to the options when selecting the type of wideband oxygen sensor to be used. A new dropdown box offers 3 choices:

- 1.) DFI Type 1
- 2.) DFI Type 2
- 3.) Generic 0-5V Linear

The DFI Type 1 and 2 choices reflect the 2 types of DFI wideband sensors available. A new option has been added to allow users to select a pre-programmed linear 0-5 volt curve representing 10.0:1 – 20.0:1 A:F ratios. This

allows users to use 3<sup>rd</sup> party wideband Oxygen sensors as long as they have a programmable output curve that can be made to match the given linear function.

CalMap Location: CTRL-C Shortcut Keys, or Configuration Menu -> Controls

## **MAP Limp-Home Mode**

Upon loss of MAP sensor signal, the ECM will retrieve a MAP value from the Alpha-N MAP vs. %TPS table. This will maintain proper operation and drivability in the event of MAP sensor failure.

## **Power Enrichment Mode**

This is a new programmable alternate Air-to-Fuel Ratio table. Entered when enabled via a configuration bit, and throttle position exceeds 1x16 programmable %TPS vs. RPM threshold. Creates a "Power on Demand" function while allowing for leaner cruising A:F ratios to increase fuel mileage under normal driving conditions.

CalMap Location: Fuel Menu -> Configuration

## **Auxiliary Launch Mode**

Alternate function for the (former) STI Input is a new mode, similar to Nitrous, intended for starting line launches. Using an input from a Trans Brake or Foot Brake switch, the user can manipulate multiple engine functions. Features include: alternate Air-to-Fuel Ratio table, High Resolution Fuel and Ignition trim tables, delay and shutdown timers, and programmable RPM, TPS, and MAP thresholds.

CalMap Location: CTRL-A Shortcut Keys, or Configuration Menu -> Aux Launch Mode

## **Fuel Mass Atmospheric Pressure Compensation**

- **Fuel Atmospheric Compensation:**  
The ECM automatically calculates a fuel correction value for any given change in atmospheric pressure – due to altitude or air density changes. Now an additional scalar to the calculated value is available to enhance the correction value calculated by the ECM. The Fuel Atmospheric Correction Modifier table will allow a 50 %– 305% modifier to be added to the calculated correction value vs. Scaled Atmospheric Pressure. This can provide better fine tuning resolution when programming for high altitude engine operation. Note that the values on the Scaled Atmospheric

Pressure axis are programmable, and can be set as needed to attain a desired level of resolution.

- Fuel Atmospheric Compensation Mask:  
A 16x16 Barometric Compensation Mask table has also been added to allow blending the amount of compensation between 0 and 100% as a function of MAP and RPM. This can be used to allow an engine to start normally, and then take advantage of atmospheric compensation after it is running, preventing an overly rich startup condition.

CalMap Location: Fuel Menu -> Steady State -> Fuel Atmospheric Comp. Modifier/Mask and Fuel Configuration Screen

## **No Manifold Surface Temperature Sensor Operation**

We have added an option on the System Configuration Screen to disable the functionality of the Manifold Surface Temp (MST) sensor. If the sensor is disabled, the MST sensor value will internally be forced to 100 degrees F for all MST related calculations.

Additionally, if the MST sensor is unused, it is possible to monitor an alternate 0-5Volt signal on the MST line by connecting the signal source in place of the MST sensor and selecting the "MST Input Voltage" from the list of data logging variables.

CalMap Location: CTRL-S Shortcut Keys, or Configuration Menu -> System

## **Offline Calibration Version Editing (Professional version only)**

Added the ability to change the version of a calibration file while editing it offline. User can pick any valid revision from the drop-down box located on the About screen when using the Professional version of CalMap.

CalMap Location: Help Menu -> About... (Professional Version Only)

## **Delayed Static Injector Error Code**

Generation of a Static injector error code is now delayed until engine speed has been greater than 400 RPM for 5 seconds.

## **Alternate Target Idle Speed table**

A second table with the same bounds as the normal target idle speed table. Entry into this mode can be controlled by STI input, based on a configuration bit to select whether the hardware input is actually looked at or not; and a minimum TPS% threshold value. The second target idle speed table is engaged when the enable is satisfied, and the TPS sensor reads  $\geq$  the threshold value, so that a value of '0' entered into the threshold effectively causes the TPS% check to be satisfied all of the time. There is also an IAC2 feed forward counts table that is applied upon entering the mode and decayed out thereafter to enable a smooth transition between the 2 target idle speeds. Finally, there is a Maximum TPS% limit for the second table, above which idle2 mode would be exited.

CalMap Location: CTRL-I Shortcut Keys, or Idle Menu -> Configuration

## **Auxiliary TPS Fueling Table**

A new fuel table has been added, consisting of %TPS on the x-axis, and a scalar of -0.25 to + 0.25 on the y-axis. The table generates an additional fueling term to be used in calculating the fuel mass value based on the current throttle position sensor reading. There is a master configuration bit to enable/disable this function and a system of enables, similar to the ones for NOS controls, offering threshold and hysteresis values for RPM, TPS%, and MAP.

CalMap Location: Configuration Menu -> Fuel

## **ECM Status & Diagnostics Screen**

An updated diagnostics screen has been created, containing virtual LED indicators, which represent the state of many of the inputs, outputs, and operating modes within the ECM. This screen can be used to gain a detailed understanding of how the ECM operates, and will aid in the diagnosing and troubleshooting of many typical installation and operational problems encountered by a wide variety of users.

## **Coolant Fan Configuration**

An additional configuration switch has been added to the Output Configuration Screen. This switch enables Fan #1 to be shut off while Fan #2 is active. Due to the wiring requirements of certain OEM fans, this feature is sometimes necessary to prevent damage to the electrical system.

CalMap Location: Configuration Menu -> Output Options Screen

## **Over Boost Control**

A new ignition rev limiter based on Manifold Pressure. This can be used in Supercharged or Turbocharged applications to prevent an overboost condition. The ignition will begin to drop cylinders at the value entered in this table. As the MAP reading rises, more cylinders will be cut until all cylinders are shut off at 0.75 PSI above the value entered in this table.

CalMap Location: Configuration Menu -> Controls Configuration Screen

## **Programmable Fuel Pump Prime Time**

A new table has been added to the Controls Configuration Screen make programmable the amount of time that the Fuel Pump Output is activated in a priming condition. Values from 1 to 10 seconds are allowed.

CalMap Location: Configuration Menu -> Controls Configuration Screen

## **Programmable Fuel Injector Offset Time**

The “dead time” for a fuel injector is now programmable. This is the time that the fuel injector is held open until fuel just begins to flow from the injector.

CalMap Location: Configuration Menu -> System Configuration Screen

## **New Lower Limit for Closed Loop Fueling ECT Threshold**

The ECM can enter closed loop fueling mode as a function of ECT. The ECT threshold has been lowered from 120 Degrees (F) to 65 Degrees (F). This will allow a wider range of applications to take advantage of closed loop fueling.

CalMap Location: Fuel Menu -> Feedback -> Closed Loop ECT Threshold

## **New Lower Limit for Knock Detection**

The ECM can enter now detect and respond to its Knock Module Input at ECT sensor temperatures of 95 Degrees (F) and above