



GEN4 PRO XTREME BigComm Pro V2.3 Firmware Updates

www.BigStuff3EFI.com

This document contains important software features updates for firmware version 2.3 The firmware update and instructions can be downloaded from the Bigstuff website under the software downloads section. You can also click this link to access the webpage directly. This document will show previous firmware updates which are already included in this current update.


<https://bigstuff3efi.com/gen4-firmware/>

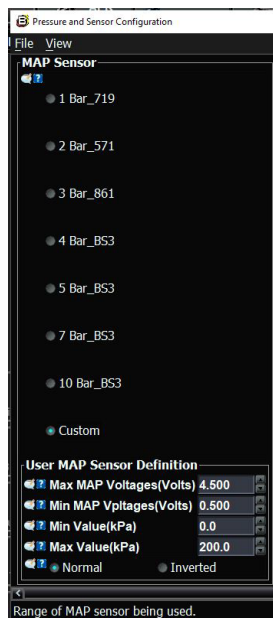
The firmware updates for this version are:

1. Custom Map Sensor Scaling
2. Enabling the Bosch O2 sensors before startup
3. Generic Port Editor Time Delays
4. Auto Shifter Time Delays
5. Dealer Configuration under the System Section
6. Fuel Injector / Ignition Coil / Digital and PWM Output Test Modes

1) Custom Map Sensor Scaling

The custom map sensor scaling will allow you to run any manifold pressure sensor based on the voltage and pressure range. We highly recommend running Bigstuff brand pressure sensors for the most consistent and highest quality sensors on the market.

To access the custom map sensor scaling navigate to the  System section in your current MAP project and select Pressure and Sensor Configuration. In the **MAP Sensor** section scroll down to the bottom and select Custom. You will then enter the Map sensor DC minimum and maximum voltage as well as the MAP sensor pressure range. The MAP sensor pressure range **MUST** be entered as KPA. The ECU will then translate the KPA values into PSI when viewing the values in the software.



See example of how to enter the values below:

A typical Max MAP Voltage is 4.5vdc

A typical Min MAP Voltage is .5vdc

The Min KPA value is typically 0 which equals 14.5" of vacuum

The Max KPA value is the max KPA for the sensor used.

This example is referencing a 2-Bar map sensor which will read from 14.5" of vacuum to 15psi of boost.


Some MAP sensors will need to have the sensor voltage inversed to the pressure reading. This will typically need to be applied on a one bar map sensor. Select "Inverted" to inverse the voltage reading for the sensor.

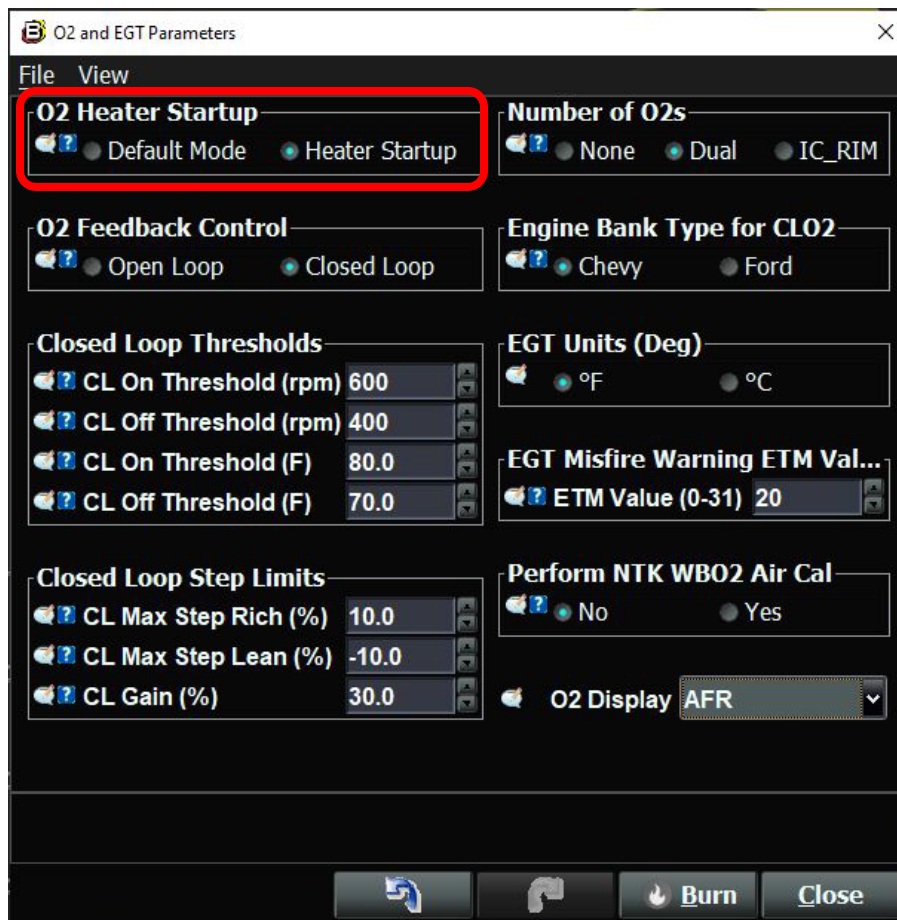
After all programming has been completed hit Burn and cycle the ignition. If the sensor is programmed correctly the KPA will read around 100KPA or 0" of boost.

PROTIP If you are changing the MAP sensor pressure range typically the Fuel/Spark/Lambda maps will need to be rescaled as well. Refer to the Bigstuff GEN4 user manual for instructions on how to rescale these tables.

2) Bosch LSU4.9 O2 Sensor Startup Enable

Depending on your tuning strategy the Bosch O2 sensors can be enabled before startup. This can be helpful when calibrating cranking fuel and afterstart fueling functions. If they are enabled before startup the O2 sensors will turn on and start heating up and registering a Lambda/AFR value. With a cold engine the O2 sensor reading will read extremely high which is completely normal. When the engine is cranked for startup the Lambda/AFR ratio will immediately begin to register and show values. The O2 sensor values being displayed will help you in calibrating the tables necessary for proper startup.

To navigate to the Bosch LSU4.9 O2 Sensor Enable go to the  AFR section and select the O2 and EGT parameters. When the window opens you will see the O2 Heater Startup menu. The Default mode is normal operation where the O2 sensors start reading once the engine is started. The Heater Startup mode will enable the Bosch O2 sensors to turn on and read the current Lambda/AFR reading.



Once an engine has been running and has been shut down it is normal that when the ignition is turned back on there will still be an Lambda/AFR value shown that may be reading somewhat normal even though the engine is not running. This is because that the O2 sensor is reading the residual fuel from the exhaust, crankcase, intake manifold, etc. Once the engine is started the values will be correct and current as its reading true exhaust flow.

Once your tuning is completed, we recommend shutting the Heater Startup off and going back into Default Mode. If the ignition is left on for extended amount of time for any reason the O2 sensors do draw power and can drain a battery if left on for extended intervals. Again, we recommend this for initial calibration only and then turning back off once you're through updating the calibration.

3) Generic Port Editor Time Delays

The Generic Port Editor is where any type of programming can be accomplished on the various physical outputs on the ECU as well as Pulse Width Modulated (PWM) Outputs. We have Time On and Off Delays based on once the output channels conditions have gone true. For more information on configuring the Generic Port Editor see the Bigstuff GEN4 manual or the System Menu Instructions.

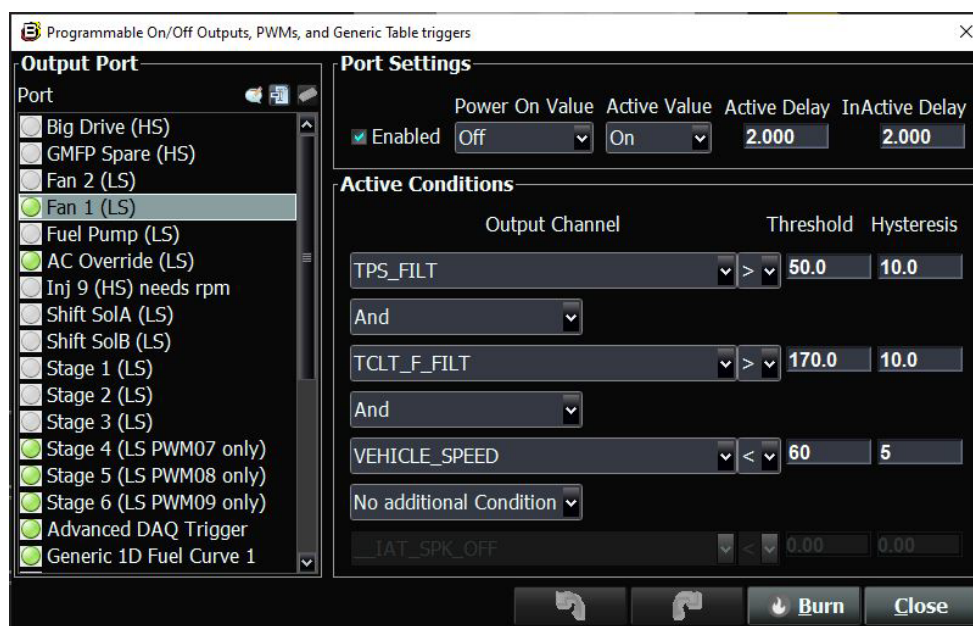
In this example we have enabled the Fan 1 (LS) output and it is configured for the following conditions:

Power On Value = *Off*

Active Value = *On*

Active Delay = *2 Seconds*


Inactive Delay = *2 Seconds*



In this example once **all the output channel conditions are true** the **Active Delay** will start which is programmed for 2 seconds. **After 2 seconds the output will enable and activate the Fan 1 output as long as all the output channel thresholds are true.** Since the logic is programmed with all AND conditions **when any of the output channels are false** then the output channel will turn off. Since the **Inactive Delay** is programmed for 2 seconds the output will then turn off 2 seconds **after the output channel logic goes false.**

4) Auto Shifter Time Delays

The auto shifter provides shifting control for your automatic transmission when being raced down the drag strip. The Auto Shifter is enabled whenever the SR2 timer is running after the three-step input has been released. The Auto Shifter can shift up to 4 independent shifts and can incorporate a time delay based on each shift.

Navigate to the  System Section menu and choose Pin Configuration. Under the Digital Outputs column make sure that Header 2 P2 is enabled as AS/GPO10(LS). This will enable the Auto Shifter / General Purpose Output setting. Close the Pin configuration window and navigate to the Operating Configuration menu again under the System Menu.



In the lower right corner of the window the Auto Shifter Parameters will be displayed. The following example is configured for the following:

Delay after TB released = This is the time delay that is entered once the Three Step has been released.

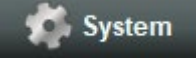
1st Gear RPM = This is the engine RPM that the Auto Shifter will output for the 1-2 shift.

1st Gear RPM Drop = The amount of engine RPM that the current engine rpm must go below to release the gear shift output. For the current example the engine shift happens at 7500rpm and with a 500rpm drop the engine rpm must go below 7000rpm to allow the next gear to be chosen.

2nd Gear Shift Delay = If the 1-2 shift occurs, the 1st gear rpm drop has been satisfied and you are already at your next gear('s) RPM shift point you can enter a time delay so that the shifter will not enable until this time expires.

Each subsequent gear shift output will work the same and you can control up to 4 shift outputs total.

4) Dealer Configuration under the System Section

The Dealer Configuration is now located under the  System Menu and is used to adjust your Crank and Cam input settings. Any changes in this menu will need to have the ECU cycle the switched ignition power to take effect. Care should be taken when adjusting these settings as having the wrong settings here could damage your engine!

Navigate to the System Menu and you will now see the Dealer Configuration listed. The full install manual goes into this section more in depth.



5) Fuel Injector / Ignition Coil / Digital and PWM Output Test Modes

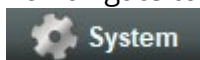
The test modes provide a powerful diagnostic tool from a fresh wiring job of an engine, testing individual outputs such as a shifter or troubleshooting an existing condition.

EXTREME CARE must be taken when running test modes as parts breakage can occur!

For example, if you pulse any of your fuel injectors and they have fuel inside of them, the fuel will enter the chamber and sit there. If you then test the ignition coil for that same cylinder the fuel will light off and you will have a that cylinder ignite. This a very bad scenario that can occur if the testing is performed improperly.

If you have any questions on the test mode so not hesitate to reach out to Bigstuff at support@bigstuff3efi.com

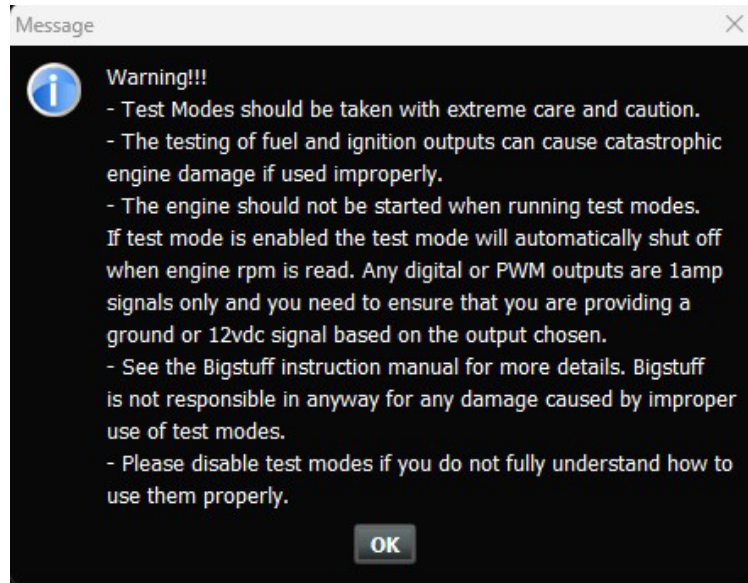
To navigate to the Test Mode open your project and navigate to the System Section



Scroll down to the Test Mode and select it. The Test Mode window will now open and show you the available options for the testing of outputs. **You must be online with your ECU in order to perform the testing of any outputs.**

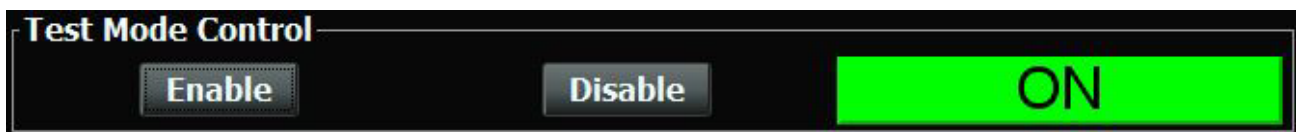
Every time you press the Enable Button a warning will pop up explaining that if used improperly that Test Modes can cause damage. You will need to press OK to accept using the Test Mode.

Once you are complete with Test Modes it is recommended to press the Disable Button and close out the window. Then cycle the ignition off and on and go back online with your ECU.



The Test Mode section is shown on **Figure 1** on page 11.

After you have pressed OK inside the Test Mode Control section the ON button will be illuminated.



After you have pressed OK inside the Test Mode Control section the ON button will be illuminated. Once Test Mode is enabled do not try and start the engine. From here you will now have the ability to test the fuel injectors, ignition coils, digital outputs and the Pulse Width Modulated (PWM) Outputs.

Fuel Injector Testing

Each fuel injector can be pulsed independently and run through the firing order. The ECU will test the appropriate fuel injector for its appropriate engine cylinder based on whether you have a Ford or Chevy motor chosen in the Hardware Configuration section.

To test a fuel injector, press the Injector button for each injector. The OFF/ON indicator will turn to ON and go green. The fuel injector for that cylinder will pulse indicating the fuel injector is working. If the fuel injector does not pulse, then the field wiring and/or fuel injector will need to be checked for proper operation.

In Figure 2 you will see how the software will show you that the fuel injector is being tested. When the pulse command is stopped by the ECU the ON/OFF indicator will go back to OFF.

To cycle through and pulse the firing order that is programmed in the ECU click on the Inj Firing Order button. The Inj Firing Order state will turn from OFF to ON indicating the test has started. Each fuel injector will now click per cylinder per the firing order. The state of each fuel injector command will change from OFF to ON indicating the fuel injector that is being tested. See Figure 3 to see a test in progress once it has been started.

Figure 2

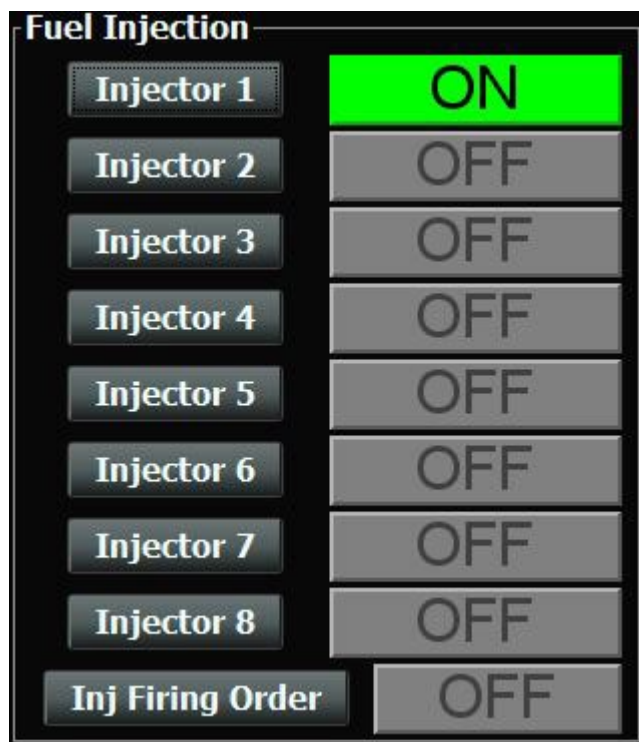
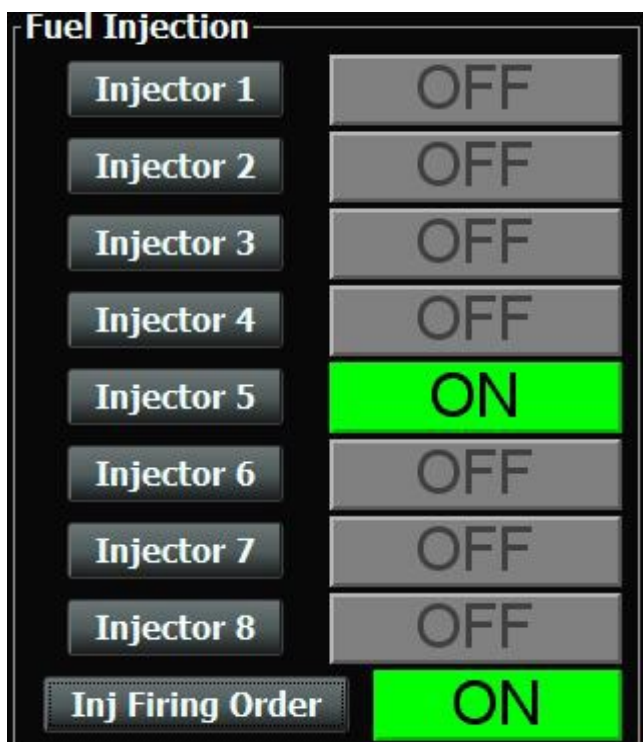


Figure 3



Ignition Coil Testing

Each ignition coil can be pulsed independently and run through the firing order. The ECU will test the appropriate ignition coil for its appropriate engine cylinder based on whether you have a Ford or Chevy motor chosen in the Hardware Configuration section.

IMPORTANT It is imperative to always ground the sparkplug when performing this test. If the sparkplug is not grounded the ignition coil can melt as it needs to be grounded to work properly. If you check an ignition coil with the spark plug in the cylinder head and there is fuel in the cylinder, it will combust and light off the fuel. When checking the ignition coils never touch the sparkplug while the test is being performed as electric shock will occur.

To test an ignition coil, press the coil button for each ignition coil. The OFF/ON indicator will turn to ON and go green. The coil for that cylinder will pulse indicating the coil is working. If the ignition coil does not pulse, then the field wiring and/or ignition coil will need to be checked for proper operation.

In Figure 4 you will see how the software will show you that the ignition coil is being tested. When the pulse command is stopped by the ECU the ON/OFF indicator will go back to OFF.

To cycle through and pulse the firing order that is programmed in the ECU click on the Coil Firing Order button. The Coil Firing Order state will turn from OFF to ON indicating the test has started. Each ignition coil will now click per cylinder per the firing order. The state of each ignition coil command will change from OFF to ON indicating the ignition coil that is being tested. See Figure 5 to see a test in progress once it has been started.

Figure 4

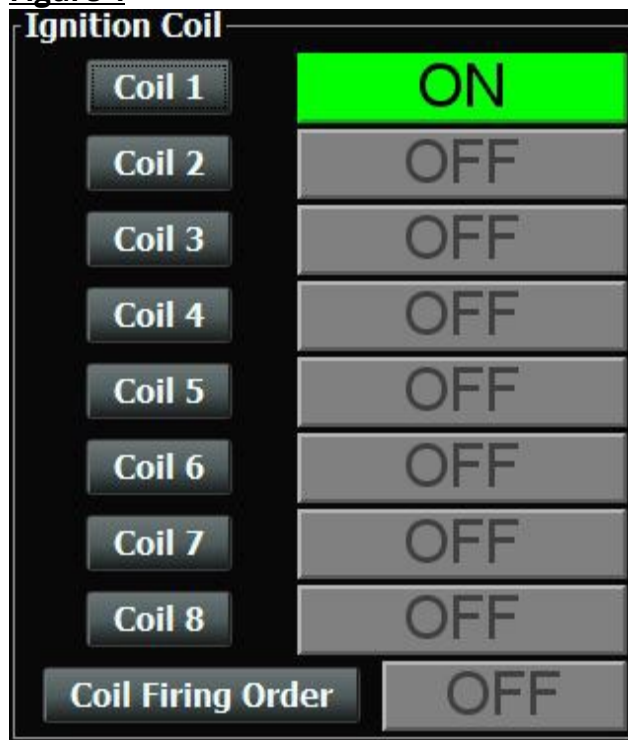
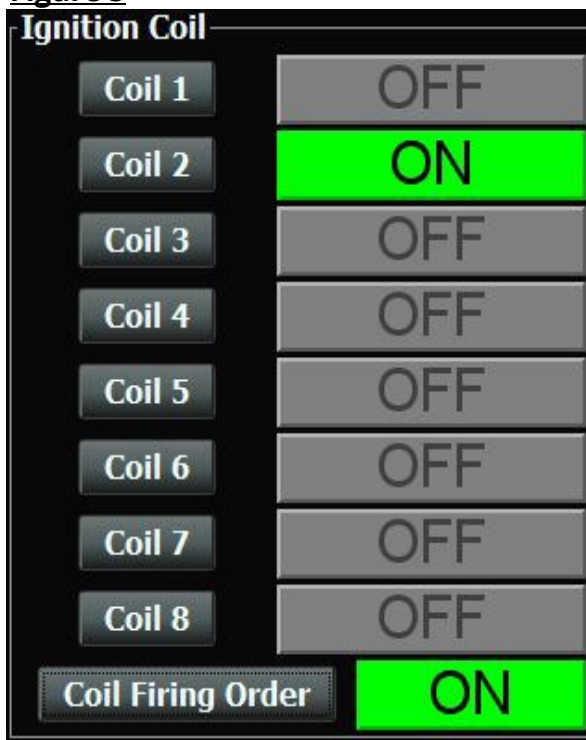



Figure 5



Digital Outputs


The Digital Outputs section consists of the outputs that control relays or other low amperage items. Figure 5 shows the digital outputs section of the Test Mode.

If you navigate to the  System Section and under Pin Configuration on the right side of the window is the digital outputs column. These are the same outputs that you will be testing in test mode whether they are setup as a specific output or generic output. A (LS) next to each output indicates a ground output and an (HS) indicates a positive output.

When you click on any digital output the output will turn from OFF to ON. The output indicator box will turn from grey to green and show ON. The output will stay ON until your press the output button again to turn the output OFF. You can enable multiple outputs at the same time versus going one by one. Each output will stay enabled until the output is turned back off.

PWM Outputs

The PWM Outputs section allows you to pulse a solid-state relay to verify proper operation of a device that will be pulse width modulated controlled. This is not meant to control a load higher than 1amp nor should a device that is not meant to be PWM controlled. Figure 6 displays the PWM Output test section.

If you navigate to the  System Section and under Pin Configuration on the lower left hand corner of the window is the PWM outputs. It is important to note that all of the PWM outputs are a ground output except for PWM05 which is a positive output. A (LS) next to each output indicates a ground output and an (HS) indicates a positive output.

PWM05 is reserved for the transmission bump output so it is recommended to use another PWM output if a transbrake bump is going to be used.

It is recommended to start with 25Hz as the frequency or speed of the signal. The duty cycle is 100% full output and 0% no output. The duty cycle can be changed in real time for the testing.

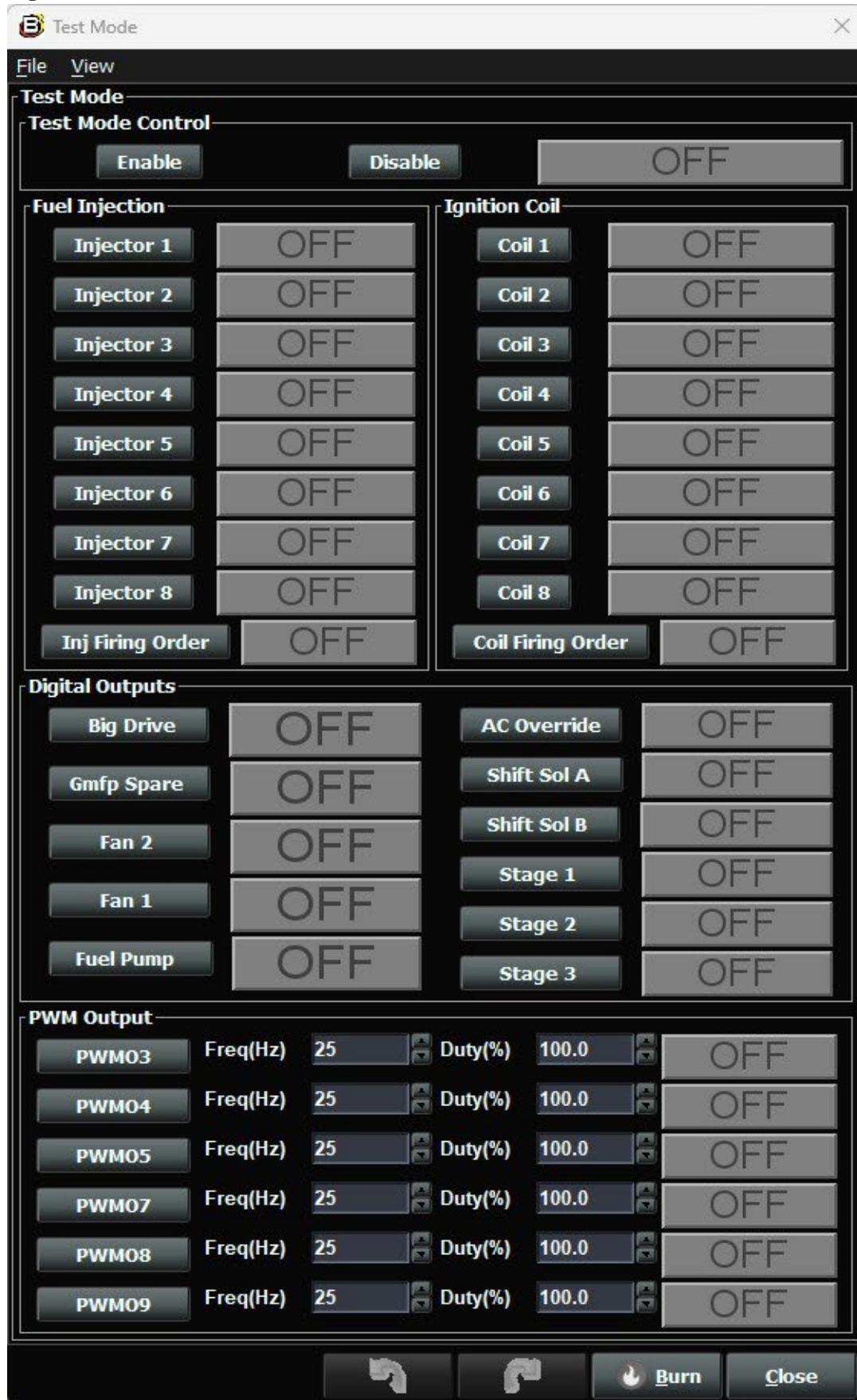
However, if the frequency(Hz) needs to be changed you must enter the desired frequency and then disable test mode. Then reenale test mode and that frequency will be used at that time. The frequency can only be programmed when the test modes are enabled.

To start the test on an output, click on the PWM(x) to test. The OFF/ON indicator will turn green and display ON. At that point the output will be pulsing at the desired frequency and duty cycle. A simple test light can confirm proper operation of the output if desired.

Figure 6



Figure 1



FREQUENTLY ASKED QUESTIONS

• What does working “On line” vs. “Off line” mean?

-Working “Off-line” = The BigStuff3 ECU is not powered up (PC Only). Working “On-line” = The BigStuff3 ECU is powered on, the communication is connected between the GEN4 ECU and a PC, and the two are communicating with each other

• Should I use the camshaft position input (cam sync) with my distributor based GEN4 system?

-Without the camshaft position input (cam input connector in the main wire harness) hooked up, the GEN4 system still provides sequential fuel injection and individual fuel control per cylinder, but injector phasing (where the fuel is injected) and individual spark control will not function.

• How can the GEN4 system provide sequential fuel injection and individual fuel control per cylinder without the cam camshaft position input hooked up?

-When the engine starts cranking over, the GEN4 ECU begins firing the injector drivers, assigned to each injector, in the firing order inputted into the software. What the GEN4 system cannot do without the cam camshaft position input hooked up is to determine where to inject fuel (the position in crankshaft degrees, relative to TDC, for each cylinder).

• At what injector duty cycle % are my injectors considered out of control, or static?

-Loss of injector control does not occur at 100% duty cycle, but at approximately 85% duty cycle. At 85% duty cycle the injectors are most likely not opening and closing in a controlled fashion.

-This condition is termed “static” (vs. dynamic) control. An example why this condition is undesirable is if the GEN4 ECU demands more fuel (demanding a larger pulse width) and the injector is already static. The only way to move more fuel through the injector would be to increase the fuel pressure. Increasing the fuel pressure at the 1/8th mile marker is not possible, so things go bad quickly.

-Also, teetering on and off at the static point is also undesirable. Lastly, running the injector drivers static for long periods of time can damage them.

• How do I set up my ignition system with the GEN4 system?

-For more information on ignition system setups, beyond what is available in this manual, go to the How To/Help section on the BigStuff3 website, and then Ignition System Setup Tutorial. The link is: <http://bigstuff3.com/pdf/Ignition%20Guide%20rev%201.2.pdf>. There are nine (9) ignition system setups outlined. There is also information on the setting up the Ford TFI, GM HEI, GM Opti-spark & MSD8 ignition systems in the How To/Help section of the website.

• Where can I find wiring harness information on the BS3 power-train system and optional systems?

-Information on most of our wiring harnesses is available on our website at www.bigstuff3.com.
-Go to the GEN4 section on the website and under the GEN4 PRO XTREME menu will be more

information. The link is: <http://bigstuff3.com/gen4/>

• **My engine will not start. What should I check?**

-Make sure the harness side header connectors, interfacing with the GEN4 ECU, are attached and tightened to no more than 15 – 20 inch lbs.

-Make sure the battery voltage is at, or above, 12V during cranking. Low battery voltage conditions must be fixed before trying to start the engine. Battery voltage (especially during cranking) is even more important with coil-on-plug applications.

-Make sure you can see an RPM signal in the software or dash. While turning the engine over, you should see at least 100 – 150 RPM. If no RPM signal is present, check that the crank input (crank trigger or distributor) signal wire is connected to the red wire in the BS3 “Crank” connector. Swap the 2 wires and try again.

-For distributor ignition based applications, make sure the BS3 points wire is connected to the ignition system points input terminal/wire. Applying 12V directly to the BS3 points wire will immediately damage the GEN4 ECU!!

-For COP engines (LSx and other standalone COP engine) the cam input cannot occur at the same time as the crank input!!! If this is the case, the engine will not start. The cam synch pulse must occur before a crank pulse. Ideally, 10* before the crank pulse.

-For more information on ignition system setups, go to the How To/Help section on the BS3 website, then to Ignition System Setup Tutorial.

-With all coil-on-plug engines, make sure the coil ground eyelet is securely fastened to the cylinder head or engine block. No other grounds locations should be used.

-The ECU may be in Clear flood Mode. Make sure the TPS sensor reads near 1-2% when the throttle is closed and near 100% when fully opened. If it reads near 100% when closed, the ECU is in clear flood mode and is not injecting fuel. Swap TPS pins A & C in the TPS connector. Make sure the crank sensor is connected.

-The LS1 Cam sensor connections are: • **A – Signal** • **B – Ground** • **C – 12V** •

The LS2 cam sensor connections must be (terminals A & C are swapped): • **A – 12V** • **B – Ground** • **C – Signal**

• **My engine timing does seem right, what should I check.**

-Make sure the firing order is correct.

-Both the BS3 GEN4 main wiring harness and the MSD ignition system must be connected directly to the battery!! If not, ground loop issues are likely to occur.

-Make sure your pulses per rev in the Operating Configuration table is correct for your application. For example, a four (4) magnet MSD crank trigger setup should have a value of 4.

• **I can't get my LSx engine started.**

-I'm using an LS2 sensor in the front of the engine.

-Swap pins A & C in the cam input connector around. My TPS sensor reads 100% when the throttle is closed and 0% when the throttle is fully opened. Swap the wires A & C in the TPS connector. The engine may not start since the ECU senses that the Clear flood Mode has been

invoked

• **If I am tuning in Alpha/N mode (Hardware Configuration, then Control Algorithm) can I use my 1 Bar MAP sensor for barometric compensation?**

-Yes, the automatic barometric compensation is hard-coded in the ECU. Leave the MAP sensor vacuum port exposed to the atmosphere. Do not plug the MAP vacuum port to the intake manifold.

• **What do I need to do to make sure my 3 step works correctly?**

-A clean 12VDC must be applied to Header 2 W1 meaning a relay with only 12vdc. Do not use the same 12VDC feeding the transbrake solenoid as flyback voltage from the transbrake releasing can damage the ECU!

-Confirm the 3 Step settings in the System Menu / RevLimiters are configured correctly. The TPS% On threshold must be higher than the Off threshold.

• **I do not think my injectors are pulsing. What can I check?**

-Make sure the BS3 and MSD systems are grounded directly to the battery.

-Plug a "noid" light into each injector position in the injector wire harness. Turn the engine over and see if the light pulses for each injector location.

• **I do not think my COP coils are firing. What can I check?**

-Make sure the BS3 main wire harness ground is wired directly to the battery.

-Make sure the coil ground wire is grounded to the engine block or cylinder head. No other ground location will work!

• **Can I use a 5 Bar MAP sensor?**

-Yes, choose 5 Bar MAP sensor in the System Menu / Pressure and Sensor Configuration section.

-Be sure to cycle the 12VDC ignition on the ECU and you will need to recalibrate the fuel/afr/spark tables on this or any MAP sensor change.

- Note: The 4 BAR MAP sensor sold by BigStuff3 is good to 52 PSI.

• **How do I know if my Bosch LSU4.9 WBO2 sensor is bad?**

-First make sure the sensor to main wire harness connection is good.

• **How can I check if my NTK WBO2 Methanol sensor is working?**

-First check the control circuitry by disconnecting the sensor from the harness. Turn the ignition to the BS3 ECU on. With the engine off its best to move the O2 sensor out of the exhaust and have it hang in the air. Go online with the ECU and navigate to the Gauge Cluster tab and go to the NTKWBO2 tab on the bottom the screen. In the upper right hand corner of the page will be LB%O2 and RB%O2 readings. Go to the AFR Menu and click on the O2 and EGT Parameters section. In the lower right hand corner turn the "Perform NTKO2 WBO2 Air Cal" to "Yes".

WARNING! Do not hold the O2 sensor as it will start to heat up and you can get severely burned. You will see the O2% readings start to update and after about 5 minutes you should be reading



about 18%-22% on either sensor. If you do not read that more than likely the sensor is defective and needs to be replaced. Contact Bigstuff3 for more details at this point. If the sensor reads fine turn the Air Cal to "Off" and turn the ignition off. Wait for the sensor to cool down and reinstall in the exhaust and you are ready to go.

• **What caused my O2 sensor to fail?**

- Being dropped
- Running leaded fuel
- Running rich at idle

• **Does the GEN4 ECU offer an auto-shift feature?**

Yes, BigStuff3 offers an optional transmission auto-shift feature. The system will shift up to five (5) speeds with independent shift RPM and Hysteresis points. Once the system is configured for the auto-shift feature, a wire from ECU Header 2 location, P2 must be run to the ground side of the relay.

• **What dwell times should be used with the LS1 coils sold with my system?**

With a 12V charging system from idle to approximately 4,000 RPM use about 3.0 milliseconds near idle and no more than about 4.0 milliseconds at approximately 4,000 RPM. From approximately 4,100 - Max RPM use no more than about 6 milliseconds of total dwell time at max RPM. With a 16V charging system from idle to approximately 4,000 RPM use about 2.0 milliseconds near idle and no more than about 3.0 milliseconds at approximately 4,000 RPM. From approximately 4,100 - Max RPM use no more than about 4.5 milliseconds of total dwell time at max RPM.

Datalogger acronyms

Point Definitions are displayed in alphabetical order and are the same for either laptop based datalogging or pulling the data from the on board SD card.

A

AC_BUMP_ON – Air Conditioning Engine RPM increase active condition

ACCEL_X – Accelerometer X Axis

ACCEL_Y – Accelerometer Y Axis

ACCEL_Z – Accelerometer Z Axis

ACCEL_ENG – Acceleration Engine value

ACT_IAC_POS – Current Idle Air Control Motor Position

AFR_TARGET – Air Fuel Ratio Target

AFR_L_BANK – Air Fuel Ratio Left Bank

AFR_R_BANK – Air Fuel Ratio Right Bank

AFR_CYL_1 – Air Fuel Ratio Cylinder 1

AFR_CYL_2 – Air Fuel Ratio Cylinder 2



AFR_CYL_3 – Air Fuel Ratio Cylinder 3
AFR_CYL_4 – Air Fuel Ratio Cylinder 4
AFR_CYL_5 – Air Fuel Ratio Cylinder 5
AFR_CYL_6 – Air Fuel Ratio Cylinder 6
AFR_CYL_7 – Air Fuel Ratio Cylinder 7
AFR_CYL_8 – Air Fuel Ratio Cylinder 8

B

BARO – Outside Barometric Pressure
BATTERY_VOLTAGE – Battery voltage
BC_SENSOR_ERROR – Boost Controller Sensor Input Error
BOOST_PSI – Intake Manifold Pressure
BOOST_CL_DC – GN Boost Controller Duty Cycle Output %
Boost_Inc PIDTerm – GN Boost Controller PID Increase %

C

CLT – Coolant Temperature
CORR_AIR – Fuel Percentage Air Temperature Correction
CORR_AFTST – Afterstart Fuel Percentage Correction
CORR_BARO – Barometric Fuel Percentage Correction
CORR_CLT – Coolant Warm Up Temperature Fuel Percentage Correction
CORR_E85 – E85 Fuel Percentage Correction
CORR_ES_PVFC – Extended Source Power Valve Fuel Correction Percentage
CORR_FP_COMP – Fuel Pressure Correction
CORR_PVF – Power Valve Fuel Correction
CORR_SLT – Start Line Fuel Percentage Correction

D

DAE_INPUT – DAE 12vdc Input true or false
DSRD_BOOST_MAP – Desired Boost Map
DSRD_SR2_MAP – Desired SR2 Map
DUTY_CYCLE_BOOST_INC – Boost Controller Duty Cycle Output Increase %
DUTY_CYCLE_BOOST_DEC – Boost Controller Duty Cycle Output Decrease %
DUTY_CYCLE_PWM07 – Duty Cycle Output Pulse Width Modulation 07
DUTY_CYCLE_PWM08 – Duty Cycle Output Pulse Width Modulation 08
DUTY_CYCLE_PWM09 – Duty Cycle Output Pulse Width Modulation 09
DUTY_CYCLE_NOS_PRG – Progressive Nitrous Duty Cycle Control Output Percentage
DUTY_CYCLE_CYL1 – Fuel Injector Duty Cycle Percentage Cylinder 1
DUTY_CYCLE_CYL2 – Fuel Injector Duty Cycle Percentage Cylinder 2
DUTY_CYCLE_CYL3 – Fuel Injector Duty Cycle Percentage Cylinder 3

DUTY_CYCLE_CYL4 – Fuel Injector Duty Cycle Percentage Cylinder 4
DUTY_CYCLE_CYL5 – Fuel Injector Duty Cycle Percentage Cylinder 5
DUTY_CYCLE_CYL6 – Fuel Injector Duty Cycle Percentage Cylinder 6
DUTY_CYCLE_CYL7 – Fuel Injector Duty Cycle Percentage Cylinder 7
DUTY_CYCLE_CYL8 – Fuel Injector Duty Cycle Percentage Cylinder 8
DUTY_CYCLE_FRCMTR – Duty Cycle Force Motor Output Percentage (Used with 4L60E/80E)
DUTY_CYCLE_TCC – Duty Cycle Torque Converter Clutch Output (Used with 4L60E/80E)
DWELL_TIME – Ignition Coil Dwell Time

E

E85_SPARK_OFFSET – E85 Spark Offset
ECM_RB_EC – NTK O2 Sensor Right Bank Error Code
ECU_SYNC – Current ECU Synchronization Status
EGT_CYL1 – Exhaust Gas Temperature Cylinder 1
EGT_CYL2 – Exhaust Gas Temperature Cylinder 2
EGT_CYL3 – Exhaust Gas Temperature Cylinder 3
EGT_CYL4 – Exhaust Gas Temperature Cylinder 4
EGT_CYL5 – Exhaust Gas Temperature Cylinder 5
EGT_CYL6 – Exhaust Gas Temperature Cylinder 6
EGT_CYL7 – Exhaust Gas Temperature Cylinder 7
EGT_CYL8 – Exhaust Gas Temperature Cylinder 8
ENG_STATE – Engine State (1-Engine Cranking, 4-Engine Running Steady, 5-Engine Accelerating, 6-Engine Decelerating, 7-Deceleration Fuel Cutoff)
EGT_SHUTDOWN_ACTIVE – Exhaust Gas Temperature Shutdown Active Condition
ETM_TORQ_STG – Engine Torque Management Torque Stage Current Value
ETM_DS_ENG_ERROR – ETM Driveshaft or Engine RPM Error
ETM_DS_ENG_DSRD – ETM Driveshaft or Engine RPM Desired

F

FP_SENSOR_ERROR – Fuel Pressure Sensor Input Error
FP_WARNING_ACTIVE – Fuel Pressure Warning Active Condition
FSL_TBL_INDEX – Fuel Spark Lambda current map enabled
FUEL_FLOW_CYL1 – Calculated Fuel flow in lbs/hr for Cylinder 1
FUEL_FLOW_CYL2 – Calculated Fuel flow in lbs/hr for Cylinder 2
FUEL_FLOW_CYL3 – Calculated Fuel flow in lbs/hr for Cylinder 3
FUEL_FLOW_CYL4 – Calculated Fuel flow in lbs/hr for Cylinder 4
FUEL_FLOW_CYL5 – Calculated Fuel flow in lbs/hr for Cylinder 5
FUEL_FLOW_CYL6 – Calculated Fuel flow in lbs/hr for Cylinder 6
FUEL_FLOW_CYL7 – Calculated Fuel flow in lbs/hr for Cylinder 7
FUEL_FLOW_CYL8 – Calculated Fuel flow in lbs/hr for Cylinder 8
FUEL_FLOW_TOTAL – Total Calculated Fuel Flow of cylinders 1-8 in lbs/hr

G

GEAR – Current Gear position calculated by engine rpm drop
GEN_BOOST_ADD – Generic Boost Tables Additional Boost Pressure
GEN_FUEL_LBSHR_ADD – Generic Fuel Lbs/hr adder
GEN_FUEL_MULT – Generic Fuel Multiplier Percentage Adder
GEN_LAMBDA_ADD – Generic Lambda Fuel Adder
GEN_LAMBDA_MULT – Generic Lambda Fuel Multiplier
GEN_SPK_ADV_ADD – Generic Spark Advance Adder
GS_ACCEL – Gear Speed Acceleration
GYRO_X – Gyrometer X Axis
GYRO_Y – Gyrometer Y Axis
GYRO_Z – Gyrometer Z Axis

H

HEAD_TEMP_RB – Head Temperature Right Bank. When in Pro Mod Mode located in the System->Hardware Configuration section this sensor is enabled for use. Pro Mod Mode sets the water and air sensors to 100* in the software so that they have no bearing on the overall VE fuel calculation. This is the GM Water Temperature Sensor.
HEAD_TEMP_LB – Head Temperature Left Bank. When in Pro Mod Mode located in the System->Hardware Configuration section this sensor is enabled for use. Pro Mod Mode sets the water and air sensors to 100* in the software so that they have no bearing on the overall VE fuel calculation. This is the GM Air Temperature Sensor.

I

IAT – Intake Air Temperature
ICF_CORR_CYL1 – Individual Cylinder Fuel Percentage Correction Cylinder 1
ICF_CORR_CYL2 – Individual Cylinder Fuel Percentage Correction Cylinder 2
ICF_CORR_CYL3 – Individual Cylinder Fuel Percentage Correction Cylinder 3
ICF_CORR_CYL4 – Individual Cylinder Fuel Percentage Correction Cylinder 4
ICF_CORR_CYL5 – Individual Cylinder Fuel Percentage Correction Cylinder 5
ICF_CORR_CYL6 – Individual Cylinder Fuel Percentage Correction Cylinder 6
ICF_CORR_CYL7 – Individual Cylinder Fuel Percentage Correction Cylinder 7
ICF_CORR_CYL8 – Individual Cylinder Fuel Percentage Correction Cylinder 8
ICS_CORR_CYL1 – Individual Cylinder Spark Correction Cylinder 1
ICS_CORR_CYL2 – Individual Cylinder Spark Correction Cylinder 2
ICS_CORR_CYL3 – Individual Cylinder Spark Correction Cylinder 3
ICS_CORR_CYL4 – Individual Cylinder Spark Correction Cylinder 4
ICS_CORR_CYL5 – Individual Cylinder Spark Correction Cylinder 5
ICS_CORR_CYL6 – Individual Cylinder Spark Correction Cylinder 6
ICS_CORR_CYL7 – Individual Cylinder Spark Correction Cylinder 7

ICS_CORR_CYL8 – Individual Cylinder Spark Correction Cylinder 8

INJ_GPW_AVE – Fuel Injector Gross Pulse Width Average

INJ_PHASE_ANGLE – Fuel Injector Injection Event Phase Angle

IOT – Fuel Injector Opening Tim

L

LAMBDA_CYL1 – Lambda Value Cylinder 1

LAMBDA_CYL2 – Lambda Value Cylinder 2

LAMBDA_CYL3 – Lambda Value Cylinder 3

LAMBDA_CYL4 – Lambda Value Cylinder 4

LAMBDA_CYL5 – Lambda Value Cylinder 5

LAMBDA_CYL6 – Lambda Value Cylinder 6

LAMBDA_CYL7 – Lambda Value Cylinder 7

LAMBDA_CYL8 – Lambda Value Cylinder 8

LAMBDA_L_BANK – Lambda Reading Left Bank

LAMBDA_R_BANK – Lambda Reading Right Bank

LAMBDA_TARGET – Lambda Reading Left Bank

LAMBDA_RB_UA – Lambda Right Bank NTK O2 Error Code

LASER_HEIGHT_AD5 – Laser Height Sensor Reading

M

MAP – Engine Intake Manifold Pressure

MPH – Miles Per Hour

N

NERNST_CYL1 – Resistance value of the Cylinder 1 Bosch O2 sensor. Normal value is around 300. **NERNST_CYL2** – Resistance value of the Cylinder 2 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL3 – Resistance value of the Cylinder 3 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL4 – Resistance value of the Cylinder 4 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL5 – Resistance value of the Cylinder 5 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL6 – Resistance value of the Cylinder 6 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL7 – Resistance value of the Cylinder 7 Bosch O2 sensor. Normal value is around 300.

NERNST_CYL8 – Resistance value of the Cylinder 8 Bosch O2 sensor. Normal value is around 300.

NOS_STAGE – Current NOS Stage

NOS_BOOST_ENABLE – Nitrous or Boost Enable Arm Switch

NOS_TIMER – When activated is the Nitrous Run Time

NOS_ICS_CORR_CYL1 – Nitrous Individual Cylinder Spark Correction Cylinder 1

NOS_ICS_CORR_CYL2 – Nitrous Individual Cylinder Spark Correction Cylinder 2

NOS_ICS_CORR_CYL3 – Nitrous Individual Cylinder Spark Correction Cylinder 3

NOS_ICS_CORR_CYL4 – Nitrous Individual Cylinder Spark Correction Cylinder 4

NOS_ICS_CORR_CYL5 – Nitrous Individual Cylinder Spark Correction Cylinder 5

NOS_ICS_CORR_CYL6 – Nitrous Individual Cylinder Spark Correction Cylinder 6

NOS_ICS_CORR_CYL7 – Nitrous Individual Cylinder Spark Correction Cylinder 7

NOS_ICS_CORR_CYL8 – Nitrous Individual Cylinder Spark Correction Cylinder 8

O

O2_CORR_CYL1 – Closed Loop O2 AFR Fuel Correction Cylinder 1

O2_CORR_CYL2 – Closed Loop O2 AFR Fuel Correction Cylinder 2

O2_CORR_CYL3 – Closed Loop O2 AFR Fuel Correction Cylinder 3

O2_CORR_CYL4 – Closed Loop O2 AFR Fuel Correction Cylinder 4

O2_CORR_CYL5 – Closed Loop O2 AFR Fuel Correction Cylinder 5

O2_CORR_CYL6 – Closed Loop O2 AFR Fuel Correction Cylinder 6

O2_CORR_CYL7 – Closed Loop O2 AFR Fuel Correction Cylinder 7

O2_CORR_CYL8 – Closed Loop O2 AFR Fuel Correction Cylinder 8

O2_CORR_L_BANK – Closed Loop O2 AFR Fuel Correction Left Bank

O2_CORR_R_BANK – Closed Loop O2 AFR Fuel Correction Right Bank

P

PCT_ETHANOL – Percentage of Ethanol in fuel (Need sensor to read properly)

PEDAL_BIT_MODE – Pedal Bit Mode Current Condition

PCT_TCC_SLIP – Percentage of Torque Converter Clutch Slippage (Used with 4L60E/80E)

PRESS_FUEL – Fuel Pressure Reading

PRESS_OIL – Oil Pressure Reading

PRESS_TURBO – Turbocharger Pressure Reading

PRESS_WG – Wastegate Pressure Reading

PRESS_NOS – Nitrous Pressure Reading

PRESS_PV – Pan Vacuum Reading

PRESS_TL – Transmission Line Pressure Reading

PRESS_DSRD_WG – CO2 Desired Wastegate

PRNDL – Park / Reverse / Neutral / Drive / Low (Used with 4L60E/80E)

R

RACE_FUEL_LBS_HR – NOS Mode Race Fuel Lbs/hr fuel adder



REV_LIMITER – Current condition of any active rev limiters
RPM_ENGINE – Engine RPM
RPM_TSS1_LB – Turbocharger Shaft Speed RPM Left Bank
RPM_TSS2_RB – Turbocharger Shaft Speed RPM Right Bank
RPM_ABS_FW – RPM Front Wheel Speed Sensor
RPM_ABS_RW – RPM Rear Wheel Speed Sensor
RPM_TOSS – RPM Transmission Output Speed Sensor or Driveshaft Sensor
RPM_TISS – RPM Transmission Input Speed Sensor

S

SLT_MODE – Start Line Timing Mode Current Condition
SHOCK_RF_AD7 – Right Front Shock Reading
SHOCK_LF_AD8 – Left Front Shock Reading
SHOCK_RR_AD9 – Right Rear Shock Reading
SHOCK_LR_AD10 – Left Rear Shock Reading
SPK_ADV_BCP – Base Spark Advance
SPK_ADV_CYL1 – Spark Advance Cylinder 1
SPK_ADV_CYL2 – Spark Advance Cylinder 2
SPK_ADV_CYL3 – Spark Advance Cylinder 3
SPK_ADV_CYL4 – Spark Advance Cylinder 4
SPK_ADV_CYL5 – Spark Advance Cylinder 5
SPK_ADV_CYL6 – Spark Advance Cylinder 6
SPK_ADV_CYL7 – Spark Advance Cylinder 7
SPK_ADV_CYL8 – Spark Advance Cylinder 8
SR2_TIMER – Current Race time after the release of the three step
SR2_GEAR1_SPK_OFFSET – SR2 Gear 1 Spark Offset
SR2_DS_SPK_OFFSET – SR2 Driveshaft or Engine Spark Offset
SR2_DS_ERROR – SR2 Driveshaft or Engine RPM Error
SR2_DS_DSRD – SR2 Driveshaft or Engine RPM Desired
SS_SPK_NOS_RTD – Street Strip Nitrous Spark Retard
SS_NOS_FUEL_ADD – Street Strip Nitrous Fuel Adder
SS_NOS_LAMBDA_OFFSET – Street Strip Nitrous Lambda Target Offset

T

TPS – Throttle Position Sensor Percentage
TOT – Transmission Oil Temperature Reading
THREE_STEP_INPUT – Three Step Input 12vdc true or false
THREE_STEP_MODE – Three Step Active Condition
TRANS_GEAR_RATIO – Current Transmission Gear Ratio (Used with 4L60E/80E)
TSD_GEAR1_OFFSET – Touch Screen Dash Gear 1 Offset
TSD_SR2_DS_OFFSET – Touchscreen Dash SR2 Driveshaft or Engine RPM Offset



TSD_ETM_DS_OFFSET – Touchscreen Dash ETM Driveshaft or Engine RPM Offset

TWO_STEP_INPUT – Two Step Input 12vdc true or false

TWO_STEP_ACTIVE – Two Step Active Condition

TWO_STEP_MODE – Two Step Active Condition

V

VE -Volumetric Efficiency number calculated from the base fuel map

W

WHEEL SPIN – Calculated wheel speed based off differential from either the rear wheel speed sensor or driveshaft sensor compared to the front wheel speed sensor.

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