GM Gas User Guide

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Contents

Prerequisites

Intended Audience

EFILive Customers using the V8 Scan and Tune Tool software.

Computer Knowledge

It is expected that readers have a basic understanding of:

- The Windows operating system;
- Starting and using Windows applications;
- Navigating folders using Windows Explorer.

Tuning Knowledge

It is expected that readers have a basic understanding of:

- Electronic Fuel Injection;
- On Board Diagnostics.

And enough common sense to understand the following:

- Make small incremental changes;
- Only make minimal changes at a time;
- Evaluate and analyze the results of each change using the Scan Tool and/or other data logging devices before making the next change;
- Do not make changes that you do not understand;
- If you are unsure about making a particular change, ask a knowledgeable tuner first.

Introduction

What is EFILive?

EFILive is tuning software and hardware - it is not a tune. Together the software and hardware give users the tools to write tunes. EFILive does not provide tune files, tuning advice or support, but do provide software support and hardware support.

Software Version Overview

This version of the GM Quick Start Guide migrates all processes to EFILive V8 Scan and Tune software. Functionality is still available in V7.5 software, however software support and bug fixes will cease in 2021.

This document was written using the following software versions:

1. EFILive V8.3.7.
2. FlashScan V3 / AutoCal V3 Firmware – V3.00.064.
3. FlashScan V2 / AutoCal V2 Firmware - V2.08.175.

The latest software versions are available for download from EFILive's website.

VIN License management and firmware management are exclusive to the V8 Scan and Tune software.

FlashScan/AutoCal V3 and AutoCal V2 are not compatible with V7 software. V7 functions are only supported by FlashScan V2. The following is a brief overview of the activities that are performed with the different software versions:

V8 Software Support

The following GM Controllers are supported in the following ways in the V8 Scan and Tune software:

Controller	Year	V8 Software				
		Scan	OBD	Read	Flash	Edit
E37	2008-2014	✔	✔	✔	✔	✔
E38	2006-2017	✔	✔	✔	✔	✔
E39/E39A	2010-2019	✔	✔	✔	✔	✔
E40	2005-2006	✔	✔	✔	✔	✔
E55	2004-2009	✔	✔	✔	✔	✘
E67	2006-2017	✔	✔	✔	✔	✔
E69	2008-2011	✔	✔	✔	✔	✘
E77	2007-2011	✔	✔	✔	✔	✘
E78	2011-2020	✔	✔	✔	✔	✔
E80	2015-2020	✔	✔	✔	✔	✘
E81	2016-2018	✔	✔	✔	✔	✘
E82	2016-2020	✔	✔	✔	✔	✘
E83	2010-2018	✔	✔	✔	✔	✘
E84	2016-2020	✔	✔	✔	✔	✘
E92	2014-2020	✔	✔	✔	✔	✔
LS1A	1997-1998	✔	✔	✔	✔	✔
LS1B	1999-2010	✔	✔	✔	✔	✔
T42	2005-2014	✔	✔	✔	✔	✔
T43	2007-2019	✔	✔	✔	✔	✔
T76	2009-2017	✔	✔	✔	✔	✔
T87	2015-2016	✔	✔	✔	✔	✔

V7 Software Support

The following GM Controllers are supported in the following ways in the V7 Tune Tool and V7 Scan Tool software:

Controller	Year	V7 Software				
		Scan	OBD	Read	Flash	Edit
E37	2008-2014	✔	✔	✔	✔	✔
E38	2006-2017	✔	✔	✔	✔	✔
E39/E39A	2010-2019	✘	✘	✘	✘	✔
E40	2005-2006	✔	✔	✔	✔	✔
E55	2004-2009	✘	✘	✘	✘	✘
E67	2006-2017	✔	✔	✔	✔	✔
E69	2008-2011	✘	✘	✘	✘	✘
E77	2007-2011	✘	✘	✘	✘	✘
E78	2011-2020	✘	✘	✘	✘	✔
E80	2015-2020	✘	✘	✘	✘	✔
E81	2016-2018	✘	✘	✘	✘	✔
E82	2016-2020	✘	✘	✘	✘	✔
E83	2010-2018	✘	✘	✘	✘	✔
E84	2016-2020	✘	✘	✘	✘	✔
E92	2014-2020	✘	✘	✘	✘	✔
LS1A	1997-1998	✔	✔	✔	✔	✔
LS1B	1999-2010	✔	✔	✔	✔	✔
T42	2005-2014	✔	✔	✔	✔	✔
T43	2007-2019	✔	✔	✔	✔	✔
T76	2009-2017	✘	✘	✘	✘	✔
T87	2015-2016	✘	✘	✘	✘	✔

Editing is not supported on E55, E69 or E77 controllers in either V8 Scan and Tune or the V7 Tune Tool.

GM End of Life Controllers

The following controllers have reached their 'End of Life' for EFILive software support, bug fixes and ongoing development in March 2016. While calibration definitions exist and will remain within the EFILive software, users are encouraged to determine if the functionality available meets their needs prior to purchase.

Controller	V7 Software					V8 Software				
	Scan	OBD	Read	Flash	Edit	Scan	OBD	Read	Flash	Edit
L31	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
P04	✘	✔	✔	✔	✘	✘	✔	✔	✔	✘
P05	✘	✔	✔	✔	✘	✘	✔	✔	✔	✘
P08	✔	✔	✔	✔	✘	✔	✔	✔	✔	✘
P10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
P11	✔	✔	✔	✔	✘	✔	✔	✔	✔	✘
P12	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

Controller Authorization

The controller authorization process has been retired in the April 2021 public release software (or later). V8.3.5 software and firmware now manage this process seamlessly via read/flash processes. The authorization module and purchasing of authorization codes is no longer required.

Licensing Requirements

To Flash a GM ECM, the following licensing conditions must be met:

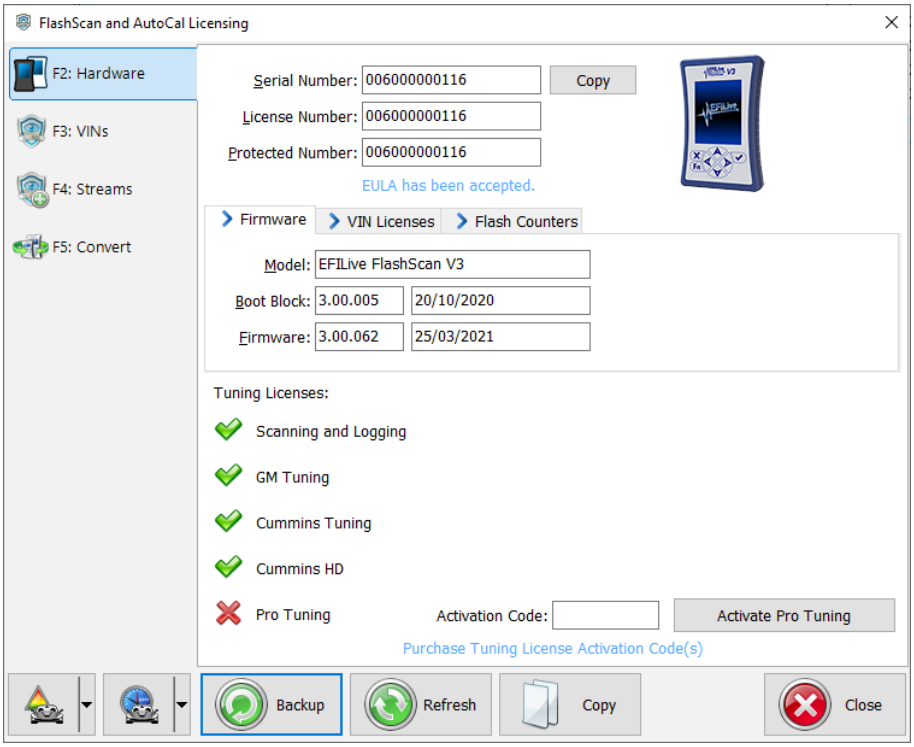
1. The GM Tuning Option must be enabled.
2. A VIN License must be available (if not already licensed).

The VIN License is NOT activated in this step. The VIN License is activated during the flash process.

GM Tuning Option Enabled

To ensure that your device is licensed to tune GM vehicles:

1. Connect your FlashScan or AutoCal device to your PC.
2. Open the EFILive Scan and Tune application.
3. Select the [F7: License] option in the left-hand pane.
4. Select [F2: Hardware] to display Tuning License details.



5. To purchase Tuning Options FlashScan, click on the **Purchase Tuning License Activation Code(s)** link to order products. NOTE: The GM Tuning Option is included on AutoCal devices, if this is not active, please contact support.
6. Enter the activation code that was emailed to you and click the Activate button.

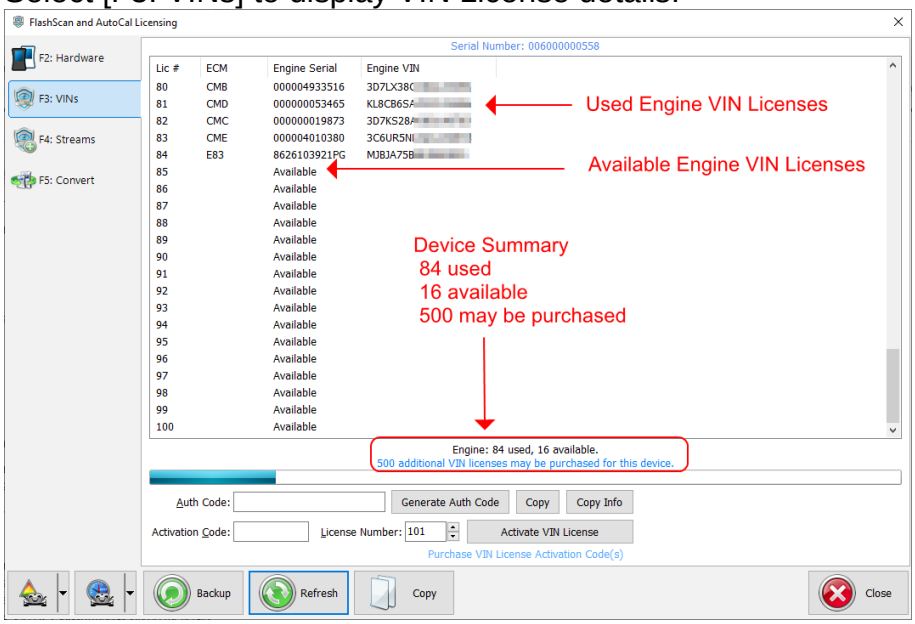
VIN Licensing

Each additional vehicle that you tune requires an available VIN license. The license is allocated during the flashing process. Reflashing the same controller

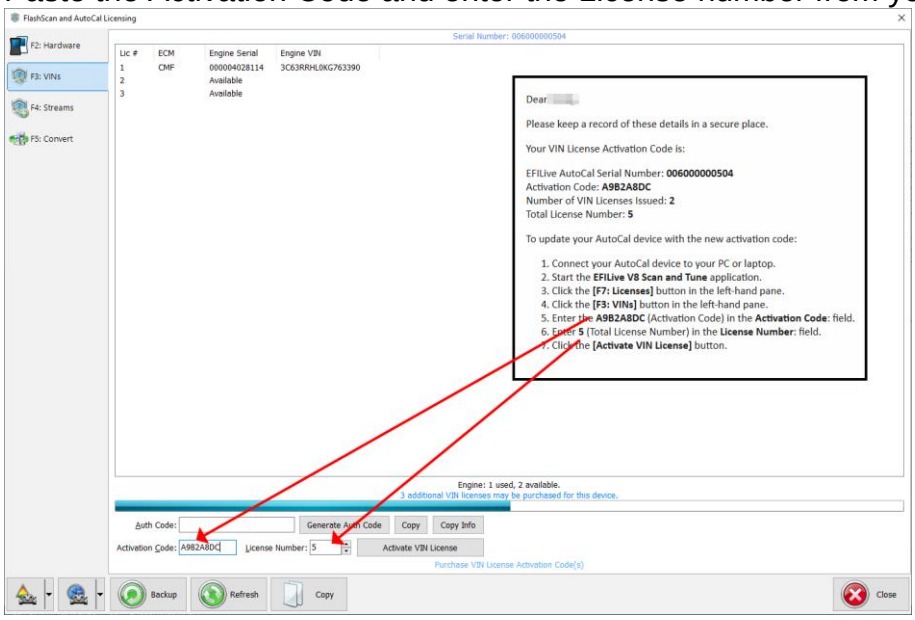
multiple times using the same FlashScan/AutoCal uses the same license each time.

To check that you have an available VIN license to allocate to your vehicle, perform these steps.

1. Connect your FlashScan or AutoCal device to your PC.
2. Open the EFILive Scan and Tune application.
3. Select the [F7: License] option in the left-hand pane.
4. Select [F3: VINs] to display VIN License details.



5. To purchase additional VIN Licenses, click on the **Purchase Activation Code(s)** link to order products. NOTE: AutoCal Users should contact their Tuner before purchasing additional VIN licenses to manage the AutoCal's maximum VIN license capacity and tune file compatibility.
6. Paste the Activation Code and enter the License number from your email.

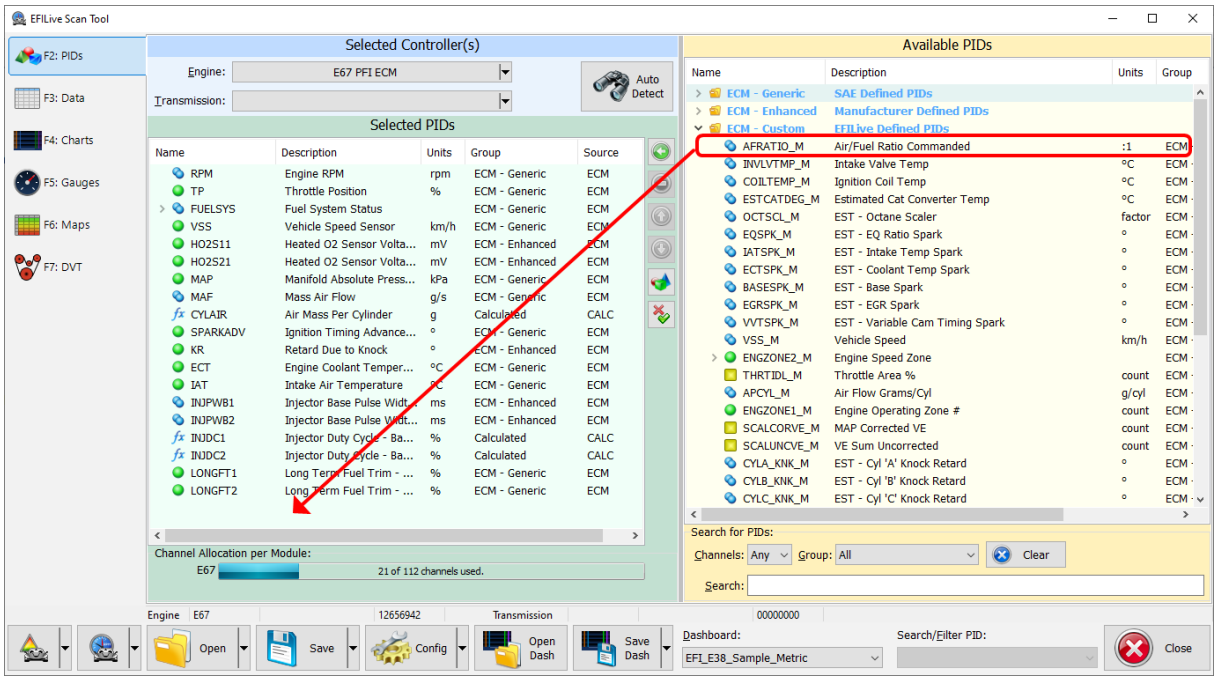


V8 Scan and Tune Scan

Pass-Thru Data Logging

To log data using FlashScan or AutoCal and V8 Scan and Tune software;

1. Open the EFILive V8 Scan and Tune.
2. Connect your FlashScan/AutoCal device to your PC and vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Select an existing Dashboard configuration either by using the [Open Dash] button or using the Dashboard drop down, or configure your own customized dashboard after making controller and PID selections.
5. Navigate to the [F2: Scan] -> [F2: PIDs] menu option.
6. In the Engine field use the drop-down list to select the correct controller type or use Auto Detect option.
7. Drag the selected PID from Available PIDs window into the Selected PIDs window.



8. Navigate to the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] tab and configure your dashboard to customize data display formats.
9. Users should [Save Dash] to save their custom configurations to reduce future configuration requirements.
10. Start the vehicle.
11. Select either Record or Monitor from the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] screens.
12. Select Stop to stop the data logging session.
13. Save the log.
14. To replay the data log, navigate to the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] tab and select the appropriate Playback buttons.

DVT

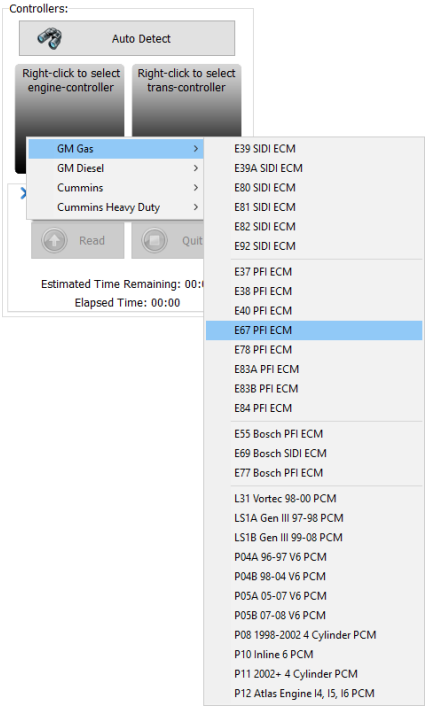
DVT is for use by experienced EFI technicians.
It temporarily overrides the normal operation of the controller and, if used incorrectly can damage the powertrain and/or the vehicle.

DVT controls are managed on the [F2: Scan] -> [F7 DVT] tab. Refer to the V8 reference manual for further information.

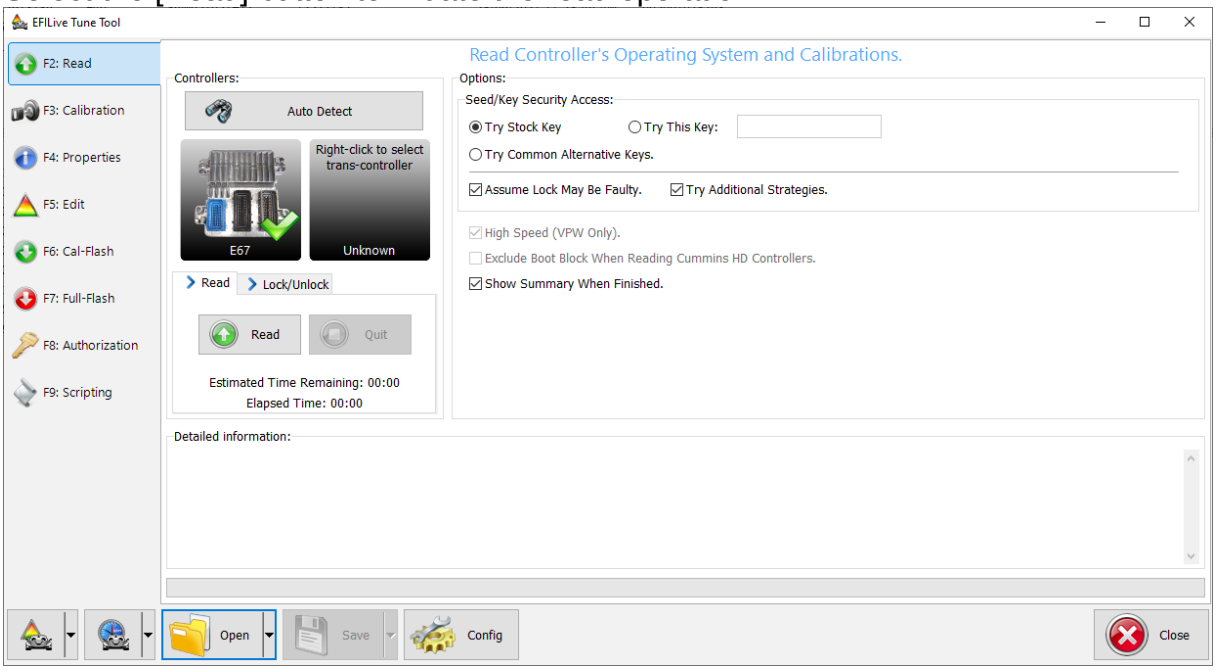
Pass-Thru Read a Controller

Follow these steps to read the selected controller.

1. Connect your FlashScan/AutoCal device to your PC and vehicle.
2. Turn the vehicle ignition to the *On* position (vehicle must not be cranked/running when reading).
3. Open the EFILive V8 Scan and Tune application.
4. Select the [F3: Tune] option in the left-hand pane.
5. On the [F2: Read] menu, select your controller(s) by using the [Auto Detect] button, or;
    1. Hover over the Engine Controller box, and right click on the “Right-click to select engine-controller” box and manually select the ECM.
    2. Navigate and select the correct controller.

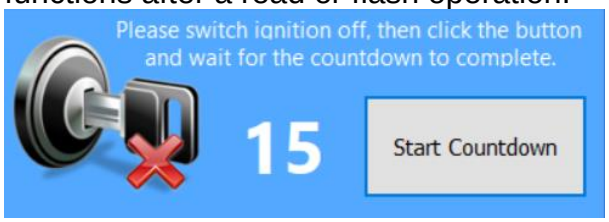


6. Select the [Read] button to initiate the read operation.



7. While the ECM is reading an Elapsed time indicator, an Estimated Time Remaining indicator, and a Progress bar will display tracking the Read progress.
8. When the read process is complete a countdown timer will be shown. When prompted perform the following actions:
    1. Turn the vehicle ignition off.
    2. Click on the Start Countdown button to begin the countdown timer.

3. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

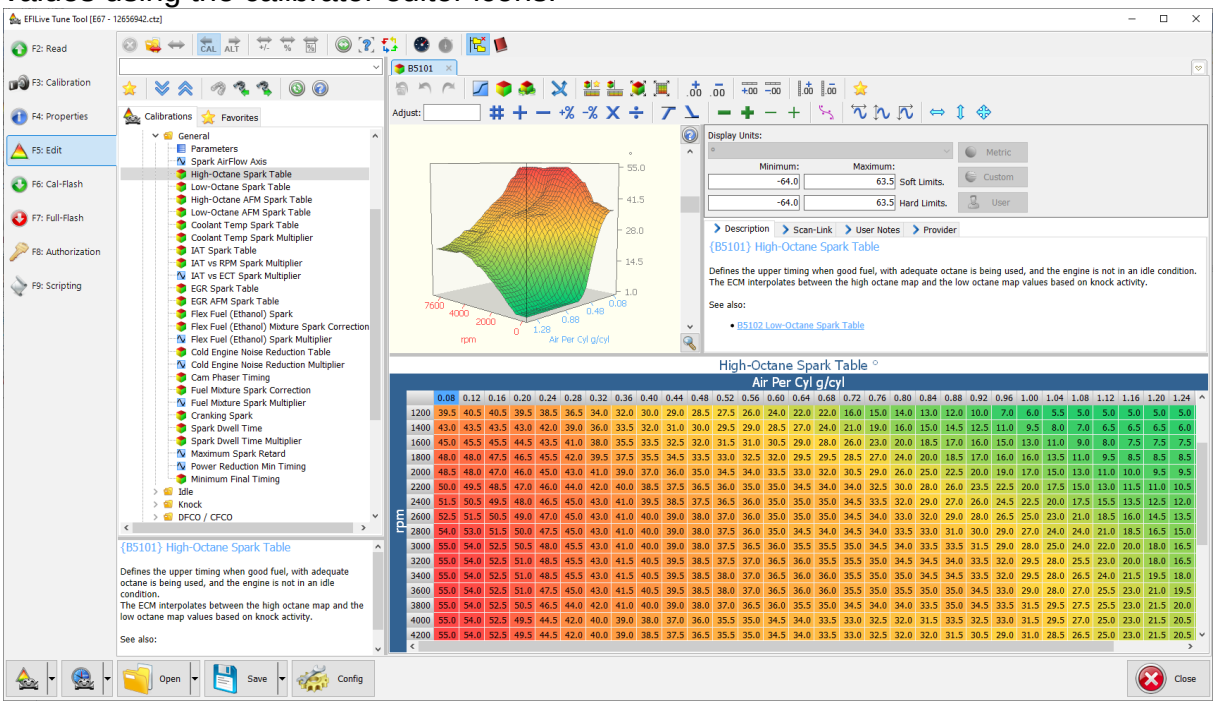


9. On the [F3: Calibration] tab, confirm Checksums are valid. Where the checksums are invalid, users should not use the file and should source a calibration file where checksums are valid.
10. If checksums are valid, save tune file. If this is your vehicle's stock calibration, you should ensure you make a backup of this file in case you ever need to return the vehicle to stock.

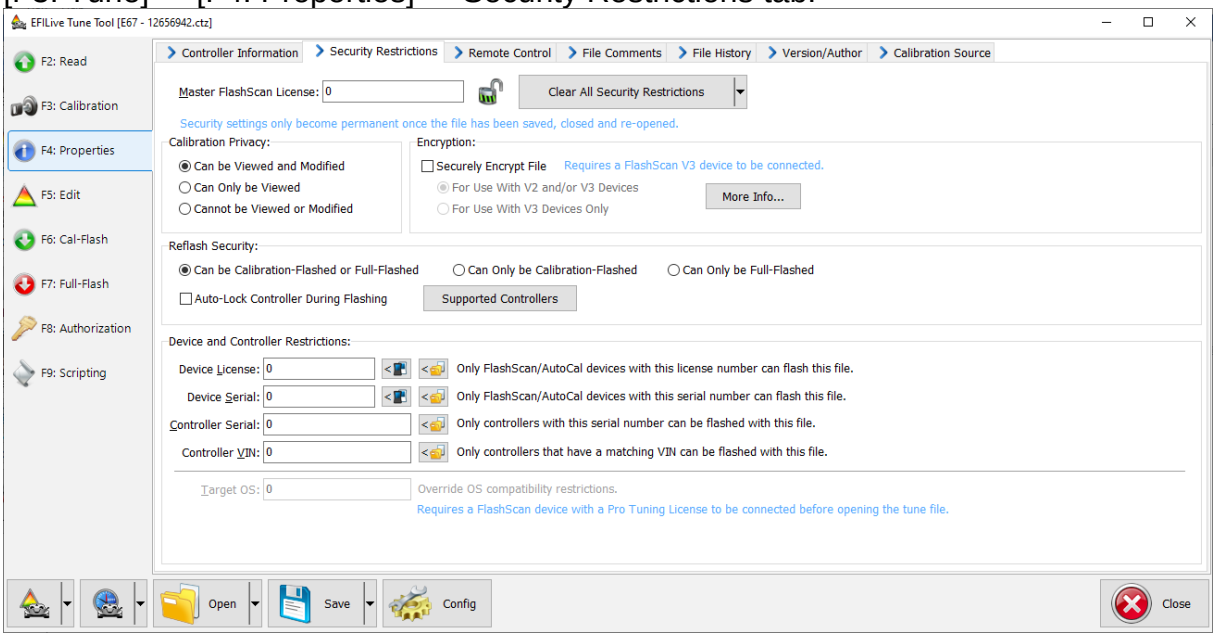
Edit a Tune File (excludes E55, E69, & E77. E80-E84 users should use V7)

Follow these steps to modify your ECM calibration.

1. Open the EFILive V8 Scan and Tune application.
2. Navigate to the [F3: Tune] -> [F5: Edit] menu in the left-hand pane.
3. Open your selected tune file.
4. On the [F3: Calibration] tab, confirm Checksums are valid. Where the checksums are invalid, users should not use the file and should source a calibration file where checksums are valid.
5. Navigate to the table(s) you wish to modify by using the Windows Explorer style navigation window.
6. Highlight a cell, multiple cells, columns, rows or the entire table and adjust the values using the calibrator editor icons.



7. A range of tune file security options can be applied using the options in the [F3: Tune] -> [F4: Properties] -> Security Restrictions tab.



8. Save changes to the tune file by using the Save tuning file, Save tuning file as, or Save tuning file for AutoCal options.

   If using the Save option, ensure you have a copy of your stock tune saved elsewhere.

   Save tuning file as, and Save tuning file for AutoCal options automatically appends a sequence number to the filename to make it unique giving users a history of sequentially numbered files with each saved change made. A FlashScan device must be connected to save security and/or AutoCal options.

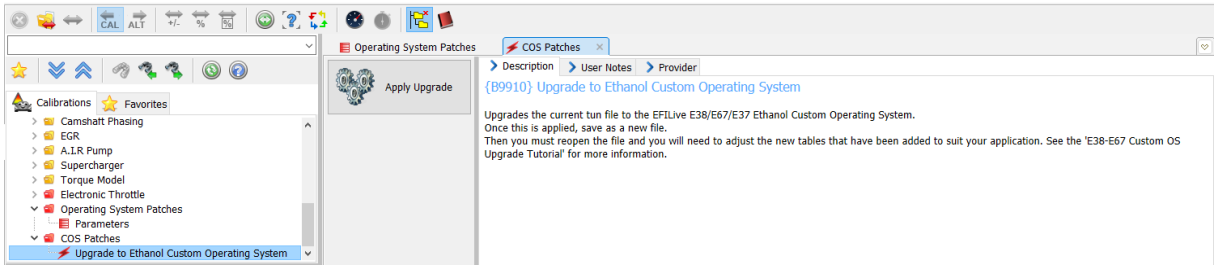
Virtual VE

Please refer to the Virtual VE Tutorial.pdf.

Custom Operating Systems

A range of custom operating systems add additional functionality to a controller by replacing the OEM operating system with an EFILive operating system. Adjustable options vary for each vehicle and are not available on all controllers or on all operating systems for a controller.

Custom Operating Systems patches are displayed in red folders in the navigator tree. The COS Upgrade parameter is displayed with a red icon. This icon does not have a modified format because once applied, a custom operating system cannot be undone. The red icon indicates that the calibration should only be modified by tuners who fully understand the consequences of the modifications.



The following table summarizes available custom operating systems.

Custom OS	Description	LS1B	E38	E67
Speed Density	Used for tuning engines with large camshafts for forced induction. The MAF is removed (or disabled) and the PCM is tuned using the MAP sensor.	✔	✔	✔
Valet Mode	Provides a secondary RPM and speed limit that you can program into your PCM. When you flip a hidden switch connected directly to the PCM, the vehicle is restricted to the preset valet RPM and speed limits. (Not compatible with N2O Control)	✔	✘	✘
Two Step Launch Control	An adaptation of the Valet Mode COS, you can use the PCM to accurately control launching. (Not compatible with N2O Control)	✔	✘	✘
2 & 3 Bar Forced Induction	Extends the fuel and spark tables to allow the PCM total control over spark and fuel all the way to full boost. EFILive retains the standard fuel and spark tables for non-boost conditions retaining factory drivability and adds new tables for boost control.	✔	N/A - feature is supported by EFILive in the standard OS.	
N2O Control	Monitors the N2O system and signals the PCM when it becomes active. Extra spark and fuel calibrations are available to modify the PCM's spark timing and fuel delivery immediately the N2O system is activated. (Not compatible with Valet Mode or Two Step Launch Control)	✔	✔	✔
Extend Cooling Fan Range	Extend operational range below factory limits	✘	✔	✔
VATS Disable	Disable Anti-theft	✔	✔	✔

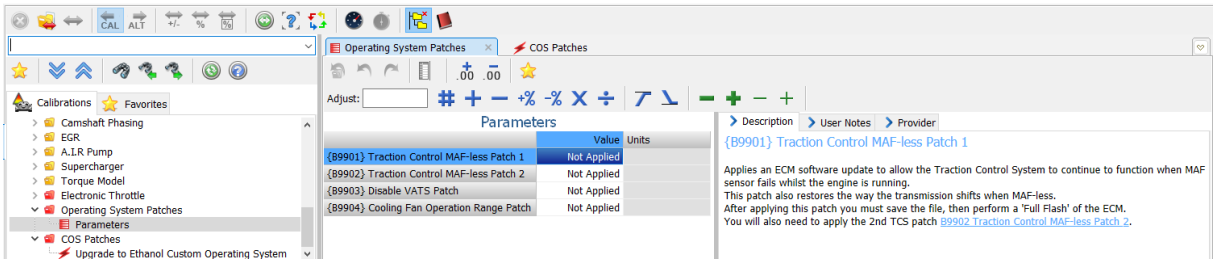
Refer to the Custom OS upgrade documentation for upgrade information.

Operating System Patches

Operating system patches enables functionality that was built into a controller but may not have been active using the OEM operating system. Adjustable options vary for each vehicle and are not available on all controllers or on all operating systems for a controller.

Operating system patches are displayed with red icons in the navigator tree. The red icon indicates that the calibration should only be modified by tuners who fully understand the consequences of the modifications.

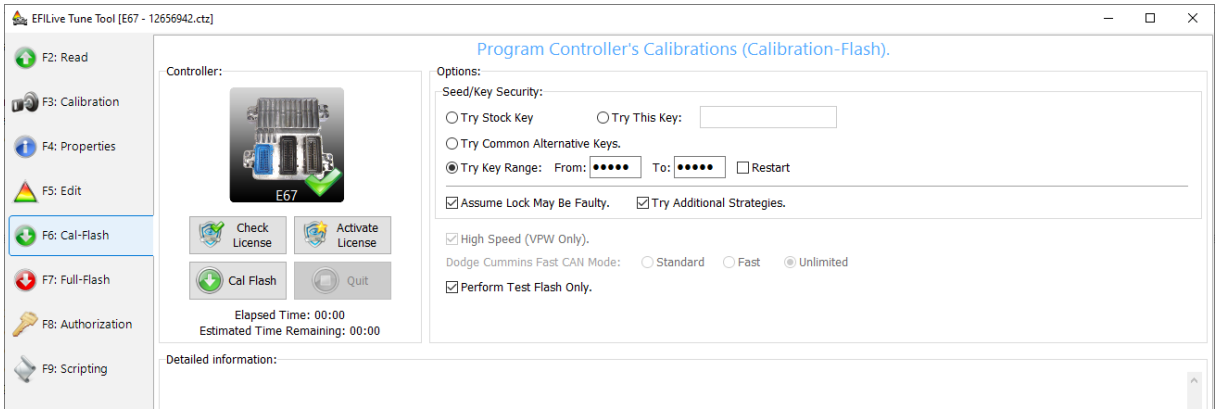
Refer to the calibration description for instructions on how to apply the patch. In the example below, the description indicates a "Full Flash" of the ECM is required to activate the patch.



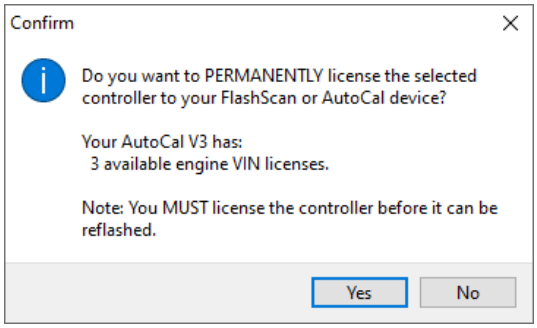
Pass-Thru Licence and Flash a Controller

Follow these steps to license and flash the selected controller.

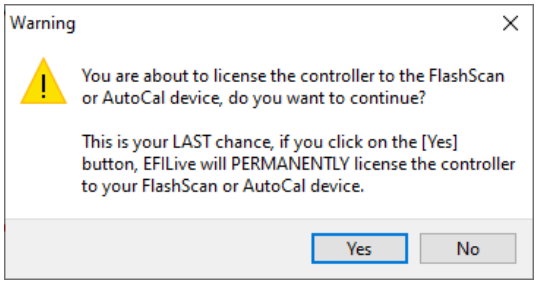
1. Open the EFILive Scan and Tune application.
2. Connect your FlashScan/AutoCal to your PC and your vehicle.
3. Turn the vehicle ignition to the *On* position, (not the Accessory position. Vehicle must not be cranked/running when flashing).
4. Select the [F3: Tune] option in the left-hand pane.
5. Click on the Open button and select the calibration file for the controller you wish to flash or license.
6. If tune file security has been applied to the tune file, review and accept the Security Warning.
7. Click on the [F6: Cal Flash] or [F7: Full Flash] option in the left-hand pane.



8. Click on the Check License button. This will indicate if the controller is already licensed or needs to be licensed.
9. Where the controller is NOT licensed, select Activate License to license the controller.
10. Select Yes to license the controller or No to close this window without licensing the controller.



11. Select Yes to license the controller or No to close this window without licensing the controller.



12. Select the Cal Flash or Full Flash button to commence the flash.

13. While the ECM is flashing an Elapsed time indicator, an Estimated Time Remaining indicator, and a Progress bar will display tracking the Flash progress.
14. When the flash process is complete a countdown timer will be shown. When prompted perform the following actions:
    a. Turn the vehicle ignition Off.
    b. Click on the Start button to begin the countdown timer.
    c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read/flash operation.

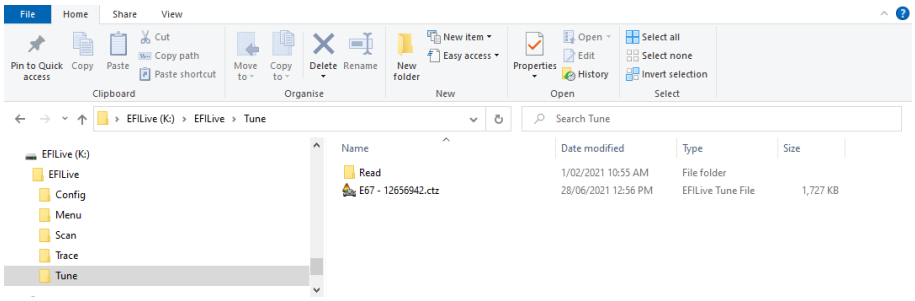
Move Tune and Log files from FlashScan/AutoCal to your PC

FlashScan/AutoCal V3

Connect FlashScan/AutoCal V3 as a USB Thumb Drive to Windows Explorer

To move tune files and log files from FlashScan V3 onto your PC;

1. Connect FlashScan V3 to your PC.
2. On FlashScan V3 navigate to Options -> File System -> USB Thumb Drive.
3. Using Windows Explorer, locate the files you wish to copy in the correct folder of your FlashScan V3 and copy or drag the files into the desired folder on your PC.

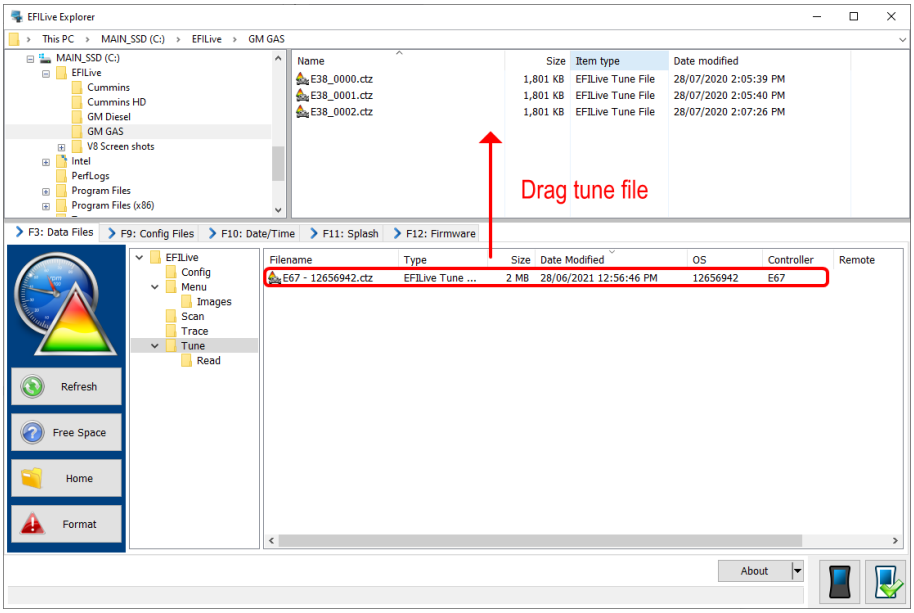


EFILive Explorer

To move tune files and log files from FlashScan/AutoCal V3 to your PC;

1. Connect FlashScan/AutoCal V3 to your PC.
2. Open EFILive Explorer.
3. Navigate to the directory on your PC where you wish to save the file.
4. Navigate to: [F3: Data Files].

5. Select appropriate folder on your FlashScan device and drag the selected file to your PC.



FlashScan/AutoCal V2

To move tune files and log files from FlashScan/AutoCal V2 to your PC;

1. Connect FlashScan/AutoCal V2 to your PC.
2. Open EFILive Explorer.
3. Navigate to the directory on your PC where you wish to save the file.
4. Navigate to: [F3: Data Files].
5. Select appropriate folder on your FlashScan device and drag the selected file to your PC.

Once tune and log files are copied from your FlashScan/AutoCal to your PC, they can be opened/viewed using EFILive V8 Scan and Tune.

Configure FlashScan/AutoCal for BBX

There are a range of configuration files that must be installed on FlashScan and AutoCal devices before the device can be used in standalone mode (BBX).

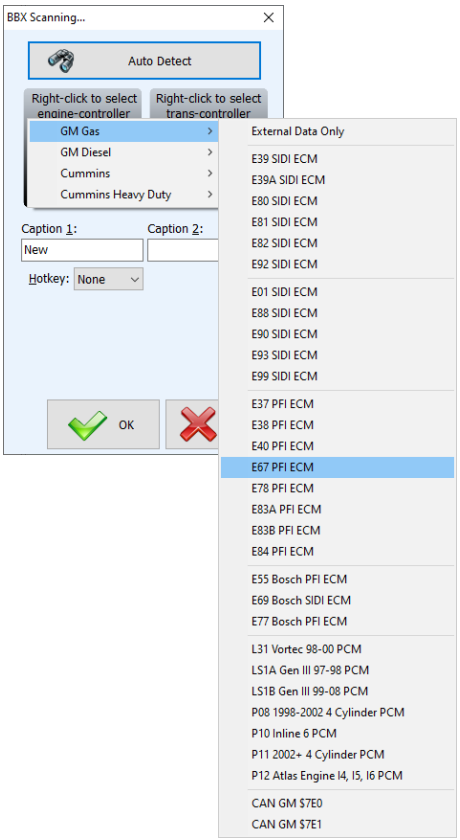
Follow these instructions to configure your FlashScan or AutoCal for BBX.

1. Connect your FlashScan or AutoCal to your PC.
2. Open the EFILive V8 Scan and Tune application.
3. Select the [F5: BBX] option in the left-hand pane.

Data Logging

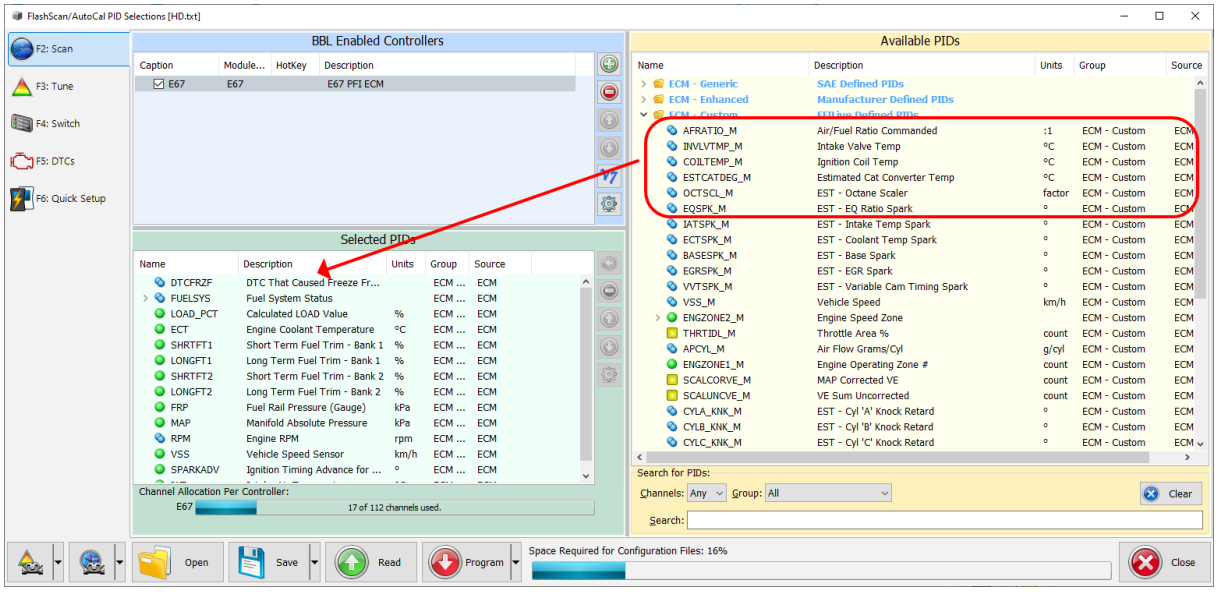
To configure data logging;

1. Select the [F2: Scan] option in the left-hand pane.
2. Remove any unnecessary controller configurations to ensure capacity restrictions are not exceeded.
3. Add your chosen controller(s) to your list;
    a. Press the green '+' icon.
    b. Right click on the Engine Controller box.
    c. Navigate to Select the correct controller.
    d. Select OK.



4. Click on the selected controller in the “BBL Enabled Controllers” window.

5. Navigate and drag the PIDs or PID folders from the Available PIDs window into the Selected PIDs window.



Configure Tuning

To configure flashing;

1. Select the [F3: Tune] option in the left-hand pane.
2. Remove any unnecessary controller configurations to ensure capacity restrictions are not exceeded.
3. Add your chosen controller(s) to your list;
    a. Press the green '+' icon.
    b. Right click on the Engine Controller box.
    c. Navigate to Select the correct controller.
    d. Select OK.

Tune File Switching

Not applicable for GM Gas applications.

Configure DTCs

To configure the display of trouble codes and descriptions onto FlashScan;

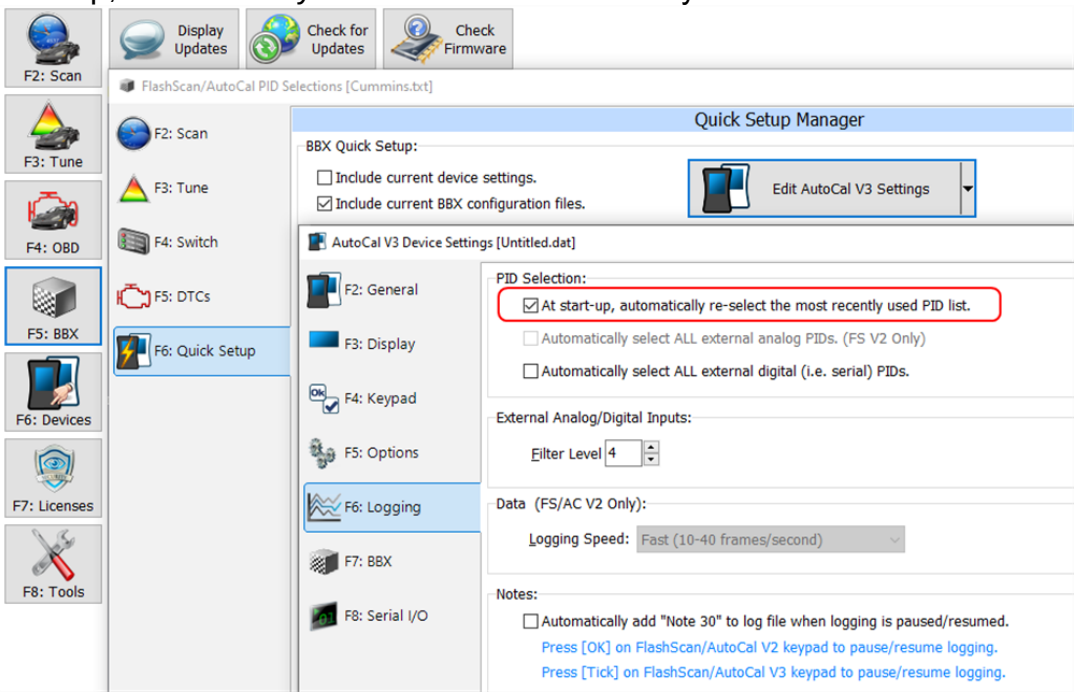
1. Select the [F5: DTC's] option in the left-hand pane.
2. Select appropriate DTC options.

Quick Setup

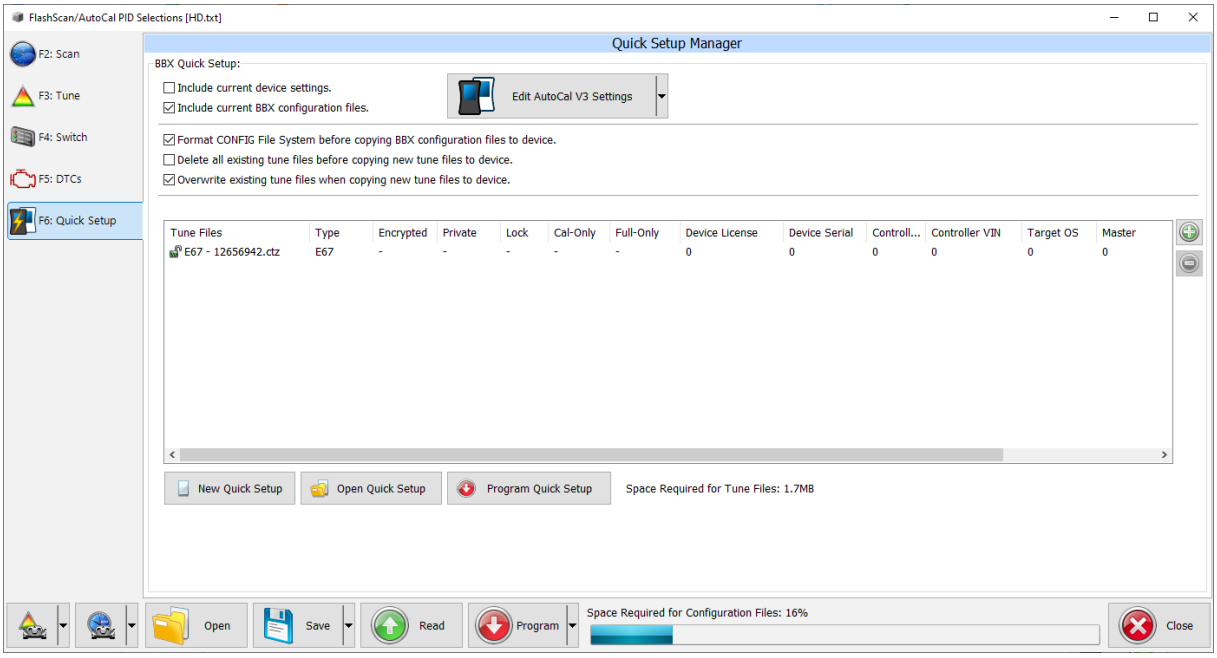
To configure BBX settings, device settings, and configure tune files for BBX;

1. Select the [F6: Quick Setup] option in the left-hand pane.
2. Select appropriate BBX configuration options.
3. Edit device settings as necessary. To automatically select the most recently used controller and PID selection when FlashScan/AutoCal powers up:
    a. Select the correct hardware on the [F6: Quick Setup] -> [Edit AutoCal V3 Settings] button.

b. In the Device Settings window, navigate to [F6: Logging] and tick the “At start-up, automatically re-select the most recently used PID list.”



4. Add tune files to the **Quick Setup** using the green '+' icon.



5. Write this configuration to FlashScan or AutoCal using the [Program Quick Setup] function. The [Program Quick Setup] programs all selected Scan, Tune, Switch, and DTC options, as well as selected device settings, BBX Quick Setup selections and tune files. Once the device is programmed, FlashScan or AutoCal is configured for BBX functions.

   Each option can be programmed individually using the [Program] button on each tab, or collectively using the [Program Quick Setup] option.

FlashScan/AutoCal Menu Navigation

FlashScan/AutoCal V3

FlashScan/AutoCal V3 supports two menu structures; the EFILive standard menu and the user defined menu. Where a used defined menu is not installed, the EFILive standard menu will be displayed.

Data Logging

1. Configure FlashScan/AutoCal V3 for BBX features if not already setup.
2. Connect your FlashScan/AutoCal V3 device to your vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the Scan Tool -> F1 Select PIDs menu option.
5. Select correct controller type from BBX configured controllers.
6. Navigate to the F1 Scan Tool -> F2 Data Logging menu option.
7. Select F1: Record Data to commence the logging session.
8. The LCD will display recording status, elapsed time, frame count and the selected PIDs.
9. A range of options are available while the Log is recording:
    1. Select ✓ to pause/resume the log.
    2. Select the up and down arrows to navigate through selected PIDs.
    3. Select X, to stop data logging and save the logged data.
10. Start the vehicle and drive to record actual performance. Do not attempt to operate a FlashScan/AutoCal device while your vehicle is in motion.
11. Select X on FlashScan/AutoCal V3 to stop data logging and save the log file.

Read a Controller

1. Configure FlashScan/AutoCal V3 for BBX features if not already setup.
2. Connect your FlashScan/AutoCal V3 device to your vehicle.
3. Turn the vehicle ignition to the *On* position. (Vehicle must not be cranked/running when reading).
4. Navigate to the Tune Tool -> F1 Tuning -> F1 Read Tune menu option.
5. Select correct controller type from BBX configured controllers.
6. Click the ✓ button to initiate the read operation.
7. While the ECM is reading a Progress bar will display for the user to visually track the read.
8. When the read process is complete, the saved file name will display. Select **X** to close this message.
9. The **Reset Controller** notification will be shown, and the controller reset process will begin.
    1. Turn the vehicle ignition off.
    2. Click on the Start button to begin the countdown timer.
    3. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

License and Flash a Controller

1. Configure FlashScan/AutoCal V3 for BBX features if not already setup.
2. Copy selected tune file(s) from your PC to FlashScan/AutoCal V3 if not already copied via Quick Setup during step 1.
3. Connect your FlashScan/AutoCal V3 device to your vehicle.
4. Turn the vehicle ignition to the *On* position, (not the *Accessory* position. Vehicle must not be cranked/running when flashing).
5. Navigate to the Tune Tool menu and select F1: Tuning and select either F2 Program Calibration or F3 Program Full menu option.
6. Navigate to the folder your tune file is located in and select ✓ to commence the flash.
7. If the controller has not been licensed by this device previously, you will be presented with an **"**Unlicensed Controller**"** message. Select ✓ to proceed with licensing the controller, or **X** to exit without licensing the controller.
8. Select ✓ to confirm licensing the controller and commence the flash, or **X** to exit without licensing the controller.
9. The Reset Controller notification will be shown, and the controller reset process will begin.
    1. Turn the vehicle ignition Off.
    2. Click on the Start button to begin the countdown timer.
    3. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

FlashScan V2

Data Logging

1. Configure FlashScan V2 for BBX features if not already setup.
2. Connect your FlashScan V2 device to your vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the F1 Scan Tool - F1 Select PIDs menu option.

5. Select correct controller type from BBX configured controllers.
6. Navigate to the F1 Scan Tool - F2 Data Logging menu option.
7. Select F1: Record Data to commence the logging session.
8. The LCD will display the elapsed time, frame count and the selected PIDs.
9. A range of options are available while the Log is recording:
    1. Select OK to pause/resume the log.
    2. Select F1..F4 or Ctrl+F1..Ctrl+F4 to add “user notes” 1 thru 8 to the log.
    3. Select Enter to toggle between Metric and US Customary units.
    4. Select the up and down arrows to navigate through selected PIDs.
    5. Select Cancel, to stop data logging and save the logged data.
10. Start the vehicle and drive to record actual performance. Do not attempt to operate a FlashScan/AutoCal device while your vehicle is in motion.
11. Select Cancel on FlashScan V2 to stop data logging and save the log file.

    NOTE: When data logging is activated you cannot return to the menu until logging is stopped.

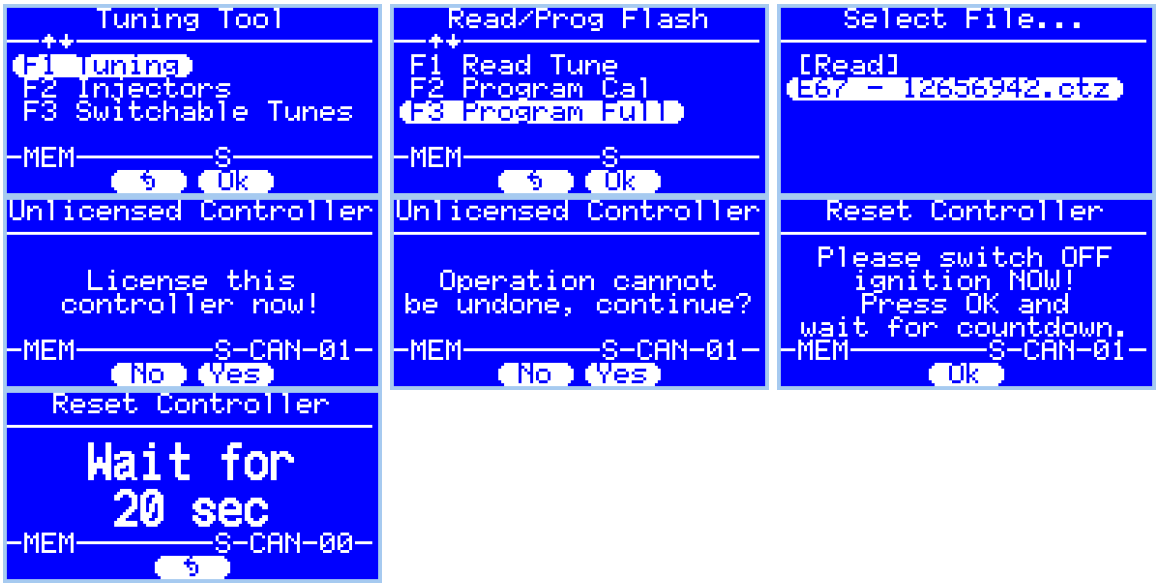
Read a Controller

1. Configure FlashScan V2 for BBX features if not already setup.
2. Connect your FlashScan V2 device to your vehicle.
3. Turn the vehicle ignition to the *On* position. (Vehicle must not be cranked/running when reading).
4. Navigate to the F2 Tune Tool -> F1 Tuning -> F1 Read Tune menu option.
5. Select correct controller type from BBX configured controllers.
6. Click the OK button to initiate the read operation.
7. While the ECM is reading a Progress bar will display for the user to visually track the read.
8. When the read process is complete, the saved file name will display. Select OK to close this message.
9. The Reset Controller notification will be shown, and the controller reset process will begin.
    a. Turn the vehicle ignition Off.
    b. Click on the Start button to begin the countdown timer.
    c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

License and Flash a Controller

1. Configure FlashScan V2 for BBX features if not already setup.
2. Copy selected tune file(s) from your PC to FlashScan V2 if not already copied via Quick Setup in step 1.
3. Connect your FlashScan V2 device to your vehicle.
4. Turn the vehicle ignition to the *On* position, (not the Accessory position. Vehicle must not be cranked/running when flashing).
5. Navigate to the F2 Tune Tool -> F1 Tuning and select either F2 Program Cal or F3 Program Full menu option.
6. Using the arrow keys, navigate to the correct tune file and select OK.
7. If the controller has not been licensed by this device previously, you will be presented with the License this controller now? message. Select Yes to license the controller or No to exit without licensing the controller.
8. Select Yes to confirm licensing the controller and commence the flash, or No to exit without licensing the controller.

9. When the flash process is complete the Reset Controller notification will be shown. When prompted perform the following actions:
    a. Turn the vehicle ignition Off.
    b. Click on the Start button to begin the countdown timer.
    c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal functions after a read operation.



AutoCal V2

Data Logging

1. Configure AutoCal for BBX features if not already setup.
2. Connect your AutoCal device to your vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the Select PIDs menu option and select OK.
5. Select the correct controller type from BBX configured controllers and make a selection using the OK button. Where only one controller is in the BBX, executing the Select PIDs option will make that selection and return to the menu.
6. Navigate to the Record Data option and select OK to commence the logging session. AutoCal will display the following to commence the logging session;
    a. Creating Log File.
    b. Starting Scanner.
7. The Time indicator will increment to indicate recording has commenced.
8. Start the vehicle and drive to record actual performance.
9. Stop the vehicle and turn the ignition off prior to saving the log on AutoCal.
10. A range of options are available while the log is recording.
    a. Select OK to pause/resume the log.
    b. Select Next to scroll forward through the list of PIDs.
    c. Select Prev to scroll backwards through the list of PIDs. Scrolling back to the very first entry displays “Exit”, when “Exit” is displayed, click OK to stop data logging and save the log.

Read a Controller

1. Configure AutoCal V2 for BBX features if not already setup.

2. Copy selected tune file(s) from your PC to AutoCal if not already copied via Quick Setup in step 1.
3. Connect your AutoCal device to your vehicle.
4. Turn the vehicle ignition to the *On* position (not the Accessory position. Vehicle must not be cranked/running when flashing).
5. Navigate using the arrow keys to the Read menu option.
6. Select the correct controller type from the previously configured BBX controllers in the Read 1-5 options. (NOTE: Unused Read options are hidden on the AutoCal Simple Menu).
7. Click the OK button to initiate the read operation.
8. When the read process is complete the following messages will be displayed.
    a. Saving Wait
    b. Checking
    c. Saved as with file name displayed on the screen.
9. The Ignition Off NOW! notification will be shown, and the controller reset process will begin.
    a. Turn the vehicle ignition Off.
    b. Click on the Start button to begin the countdown timer.
    c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

License and Flash a Controller

1. Configure AutoCal for BBX features if not already setup.
2. Copy selected tune file(s) from your PC to AutoCal if not already copied via Quick Setup in step 1.
3. Connect your AutoCal device to your vehicle.
4. Turn the vehicle ignition to the *On* position (not the Accessory position. Vehicle must not be cranked/running when flashing).
5. Navigate using the arrow keys to the Prog 1-5 options for calibration flash, or the Full 1-5 options for full flash. (NOTE: Unused Prog/Full options are hidden on the AutoCal Simple Menu).
6. Select the correct tune file from those listed and select OK.
7. If the controller has not been licensed by this device previously, you will be presented with the License controller message.
8. Select OK or Prev to exit without licensing the controller.
9. Select OK to license the controller and initiate the flash operation or Prev to exit without licensing the controller.
10. When the flash process is complete the Ignition Off NOW! notification will be shown. When prompted perform the following actions:
    a. Turn the vehicle ignition off.
    b. Click on the OK button to begin the countdown timer.
    c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal, initialization functions after a read or flash operation.

Configure Wide Band O2

EFILive supports a range of wide band O2 controllers. Please refer to the manufacturer's instructions for installation.

Company	Product	Integration
Innovate Motorsports	LC-1, LM-1, LM-2	Serial
PLX Devices	SM-AFR	Serial
AEM Performance	AEM UEGO	Serial/GPM
Just Another Wideband	Jaw	Serial
Tech Edge	TechEdge 1.5, TechEdge 2.0	Serial
FJO Racing	Gen-1, Gen-2, Gen-3	Serial
ECM	AFM1500	Serial
Zeitronix	ZT2, ZT3	Serial
Ecotrons	ALM	Serial
Ballenger	AFR500V2	GMP

The wide band will need to be configured for use with EFILive hardware and the required "Digital" PIDs will need to be selected for logging.

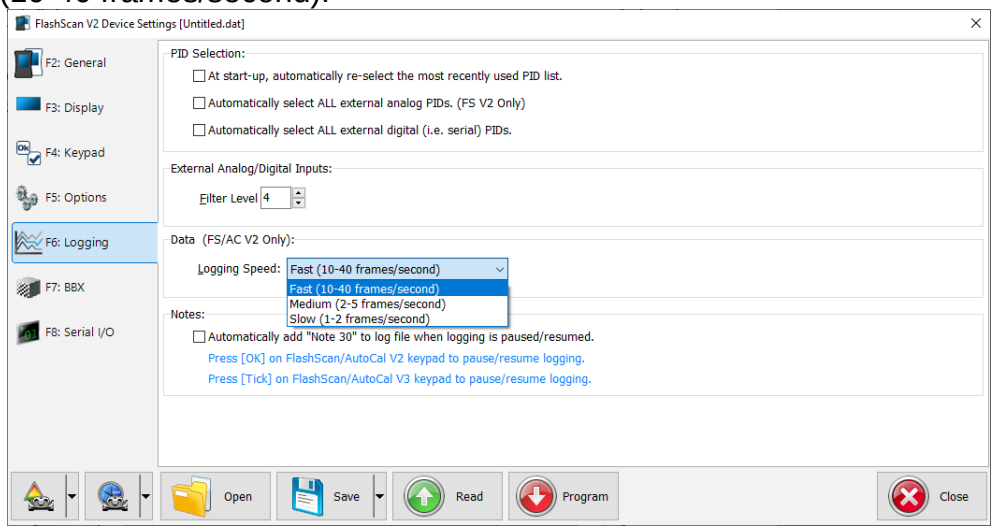
Hardware Configuration

1. Connect your FlashScan/AutoCal to your PC.
2. Open the EFILive V8 Scan and Tune application, and then select either:
    a. Select the [F6: Devices] option in the left-hand pane; or
    b. Select the [F5: BBX] -> [F6: Quick Setup] menu and select the correct device from the Edit Device Settings option.

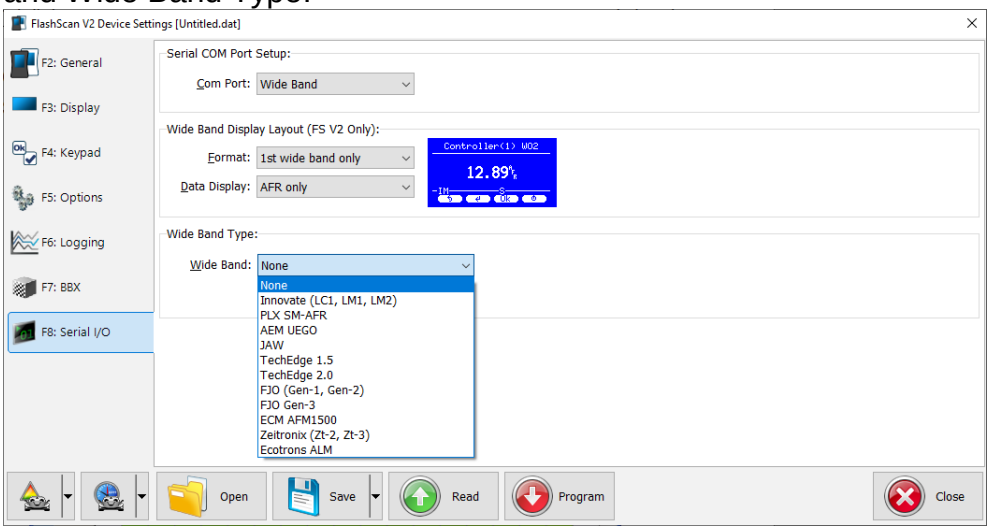
Both menu options perform the same function, however the option via the [F5: BBX] -> [F6: Quick Setup] allows these settings to be programmed in a single process along with all other BBX settings. The option via [F6: Devices] requires separate programming to other BBX settings.

Navigate to the Device Settings option using either of the above methods then;

1. For FlashScan/AutoCal V2, select [F6: Logging] and set Logging Speed: Fast (10-40 frames/second).



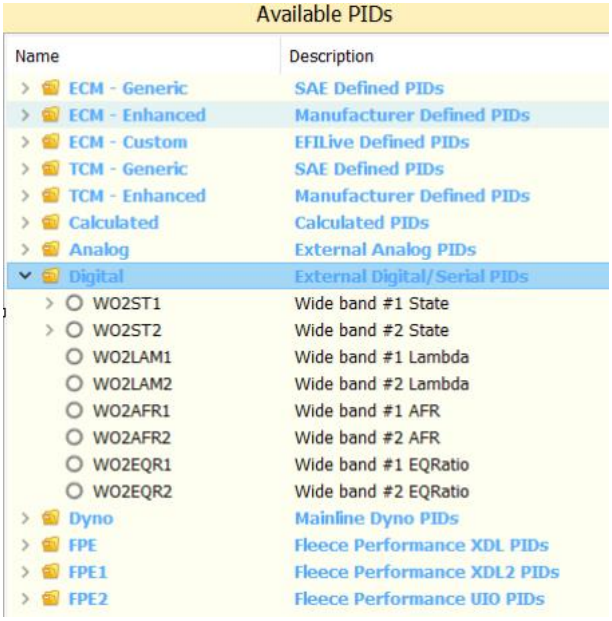
2. Navigate to [F8: Serial I/O] and select appropriate Com Port, Display Layout and Wide Band Type.



3. Program FlashScan/AutoCal using the Program option, or
4. Select Close to return to the Quick Setup, select Include current device settings, and Program Quick Setup.

Logging Serial Wide Band O2 PIDs

For logging serial wide band O2 data the user should select one or more of these “Digital” PIDs:



Each PID has two options, identified by the final digit in the name.

1. Wide band controller 1
2. Wide band controller 2 (assuming 2 wide band controllers are in use).

The WO2STn PID shows the state of the wide band, which will be one of:

- Unknown: Usually because of a communications failure - i.e. not plugged in.
- Lambda: The wide band controller is returning valid Lambda/AFR/EQR data.

- %O2: The wide band sensor has detected free air, i.e. it is not fitted to the exhaust and/or the engine is not running.
- Cal: The wide band controller is calibrating the wide band sensor.
- NoCal: The wide band sensor has not been calibrated.
- Warmup: The wide band sensor has not yet reached operating temperature.
- HCal: The wide band controller is calibrating the wide band sensor heater.
- Slow: The wide band sensor is slow to warm up.
- Cold: The wide band sensor is too cold.
- Hot: The wide band sensor is too hot.
- Error: An unknown error occurred.

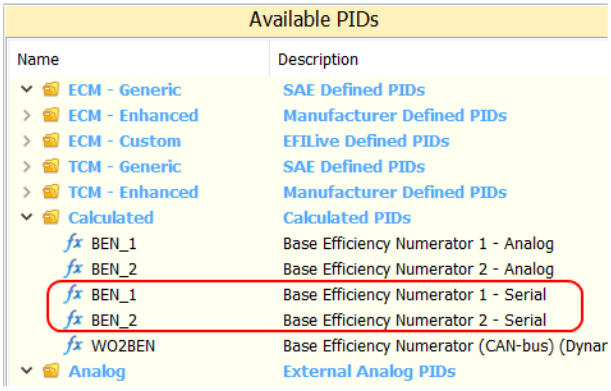
Not all wide band controllers provide the same level of status reporting so some wide band controllers just show "Lambda" or "Error" or some other reduced combination of statuses.

When the WO2STn PID's value is "Lambda", then:

- The WO2LAMn PID contains the fuel ratio in Lambda units.
- The WO2AFRn PID contains the fuel ratio in AFR (Air Fuel Ratio) units.
- The WO2EQRn PID contains the fuel ratio in EQR (Equivalency Ratio) units.

For logging BEN factors with the serial wide band, the user should select one or both of these serial BEN factor PIDs:

- Select BEN_1 for use with wide band controller 1
- Select BEN_2 for use with wide band controller 2



Open the [F2: Scan] tab page and select the target controller(s) on the [F2: PIDs] tab page. You can select both an engine and transmission controller. However, only one device may have DVT controls active.

Support

Trouble Shooting

Should users encounter problems with the EFILive software, FlashScan or AutoCal hardware they should:

1. Confirm software, firmware and boot block versions are up to date.
2. Check that checksums are valid.
3. Check to see if the NVRAM in the ECM is functional.
4. Non-EFILive Custom Operating Systems tune files cannot be edited using EFILive software. Please obtain a stock file for editing purposes.
5. Remove/isolate all after-market devices including mobile phone adapters, after-market equipment (audio systems, security, remote start etc.) and any devices wired into the OBD port that may interfere with vehicle communications.
6. DO NOT operate any vehicle feature that may communicate on the data bus. This includes opening or closing of hood, doors, windows, as well as changing settings on radio, HVAC, connecting/removing charging devices etc.

Error Codes

If an error occurs while using AutoCal, users can look up the error code description in the EFILive V8 Scan and Tune software.

The [F8: Tools] -> [F8: Error Codes] menu item provides an error code lookup function, and the “EFILive Error Codes.pdf” document accessed by selecting the Windows Start Icon and navigating to Program Files->EFILive->V8->Documents->EFILive Error Codes.pdf is also available. Both options provide error code descriptions, causes and actions.

Should the issue not be resolved after reviewing the Error code list, end users should contact their Tuner for support.

Checksums

Checksums perform a vital role in ensuring the integrity of the data in the tune file. There are two main reasons that checksums display as invalid:

1. The data in the file is corrupt and MUST NOT be flashed into a controller.
2. The data in the file has been modified with a software package that did not update the checksums – such as a hex editor.

Do not correct the checksums unless you know the tune file was modified outside of the EFILive software and that the modifications are correct and accurate.

If you correct the checksums of a file with corrupt data you are merely masking corruption. If you flash a corrupt file into a controller, you risk damaging the controller and/or causing the vehicle to operate incorrectly.

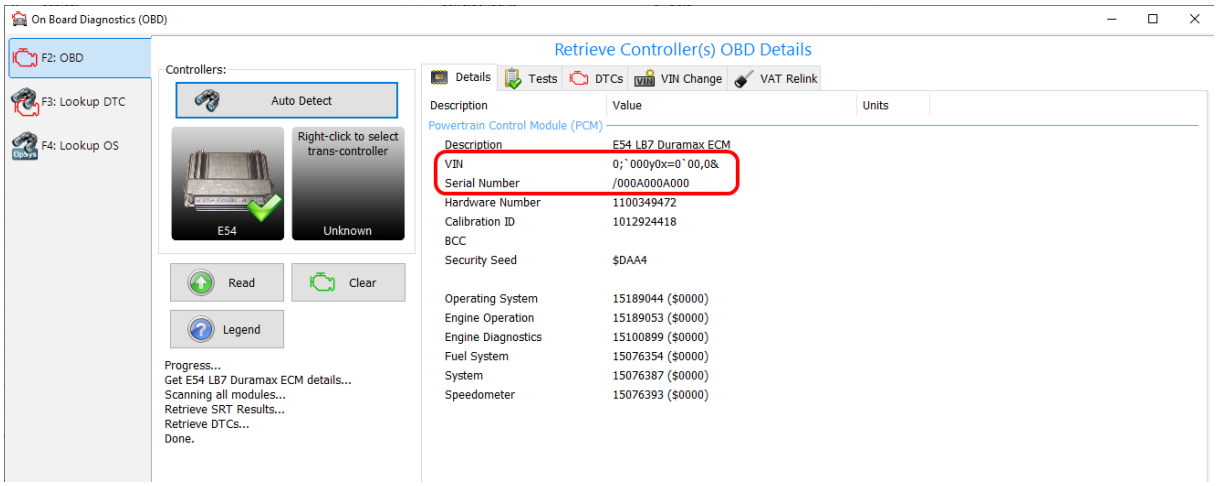
NVRAM Status

If the NVRAM area of the ECM is corrupted the vehicle may still run, however it may not be possible to read or flash the controller. Typically, if the VIN, Serial number, Hardware number and/or calibration ID do not contain valid data, the controller will need to be repaired to restore full functionality.

An error code received during reading and/or flashing may indicate a NVRAM issue.

To identify if the NVRAM is functional or corrupt:

1. Open the EFILive V8 Scan and Tune software.
2. Connect your FlashScan/AutoCal device to your PC and vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the [F4: OBD] -> [F2: OBD] menu option and select the [Details] tab.
5. Select your controller(s) by using the [Auto Detect] button, or;
   a. Hover over the Engine Controller box, and right click on the “Right-click to select engine-controller” box and manually select the ECM.
   b. Navigate and select the correct controller.
6. Click the [Read] button to populate controller data.
7. Where the VIN, Serial number, Hardware number and/or calibration ID either contain all zeros or non-numeric characters, the controller will need to be repaired to restore full functionality.



Controller repair requires the flash chip to be replaced in the ECM. A number of companies can perform this service including SoCal Diesel and Wait4Me Performance.

GM Fast CAN Mode

Two flash speeds exist for GM controllers;

1. **GM Fast CAN** delivers the fastest possible flash time and is approx. 50% faster than standard flash routines.
2. **Standard** can be used if you experience flash failures when using Fast CAN, try unchecking that option and retry the flash.

GM Fast CAN Mode by default is set to “Yes” and can be modified for both Pass-Thru and BBF the following ways:

1. [F6:Devices] -> [F5: Options] tab and programming the device.
2. Via FlashScan and AutoCal hardware by editing the device options.

If the following failed flash error codes are received, users should adjust the GM Fast CAN Mode to “No” and try the flash again.

- $0312 Sub Function Not Supported or Invalid Format ($12).
- $0322 Conditions Not Correct or Request Sequence Error ($22).
- $0370 Upload Or Download Not Accepted ($70).
- $0371 Transfer Suspended ($71).
- $0372 Transfer Aborted ($72).
- $0374 Illegal Address In Block Transfer ($74).
- $0375 Illegal Number of Bytes In Block Transfer ($75).
- $0376 Illegal Block Transfer Type ($76).
- $0377 Block Transfer Data Checksum Error ($77).
- $0379 Incorrect Byte Count During Block Transfer ($79).
- $0385 General Programming Failure ($85).

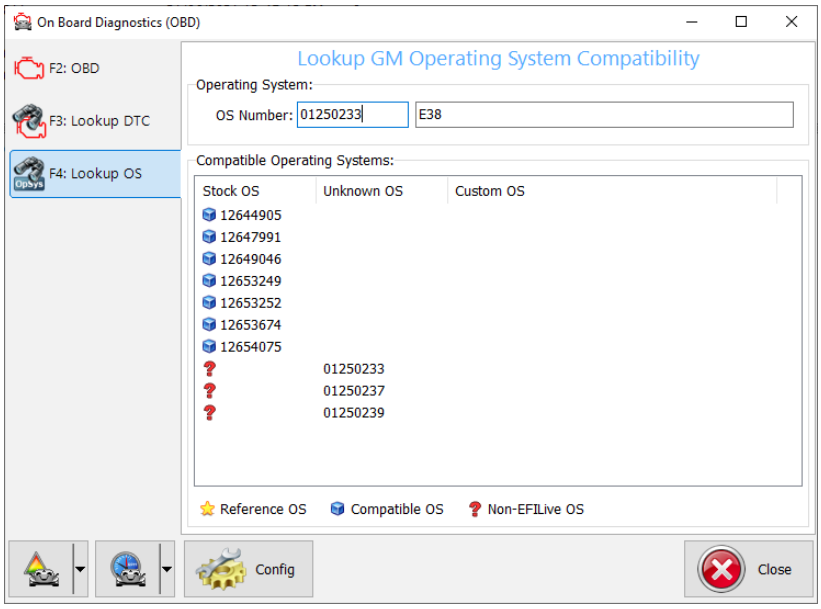
EFILive recommends restoring GM Fast CAN Mode back to "Yes" if setting it to "No" did not fix the problem. Otherwise all future flash attempts will continue to operate at the slower speed.

Unsupported Operating Systems

While almost all factory operating systems are supported by the EFILive Scan and Tune software, non-EFILive custom operating systems are not.

Where the Editor is not available for your tune file, customers should determine if the file is a non-EFILive operating system before contacting EFILive for support. To check GM operating system compatibility;

1. Navigate to the [F4: OBD] -> [F4: Lookup OS] menu option.
2. Enter the operating system number identified in your read file.
3. Compatible operating systems, and non-EFILive operating systems will be listed.



4. Where a non-EFILive operating system is listed, customers will need to obtain a compatible stock operating system for editing.
5. Where the operating system is not listed on the compatibility table, customers should create a support ticket, and include their read file for EFILive to investigate support options.

VPW Controller Recovery

To attempt to recover a failed flash a VPW based controller;

Full Flash

1. DO NOT REMOVE POWER FROM THE CONTROLLER. As long as the controller remains powered up, EFILive's proprietary boot loader running in the controller will continue to wait for a successful full flash procedure. Retry the full flash procedure until it is successful.
2. POWER REMOVED FROM CONTROLLER. If power has been removed from the controller, it may be recoverable if the flash was at least 15%-20% complete and the communications portion of the operating system was reprogrammed to allow the controller to continue to operate in dead poll mode. Retry the full flash procedure.

If flashing fails with a "no communications" error then the controller has probably been rendered inoperable and unrecoverable. The only way to recover the controller is to disassemble it and physically remove, reprogram and replace the flash chip on the main circuit board.

Calibration-Flash

A calibration-flash failure is not critical and will generally not result in an unrecoverable controller. To recover from a failed calibration-flash, turn the ignition off, wait 30 seconds, turn the ignition back on, wait a further 10 seconds, then retry the calibration-flash.

If the calibration-flash continues to fail:

1. Remove battery power from the controller, by either removing the controller's fuse or by disconnecting the battery from the vehicle.
2. Wait 30 seconds.
3. Reconnect power.
4. Retry the calibration-flash.

Failed Flash Recovery Methods (all CAN based controllers)

In the event that an ECM fails during the flashing process, recovery methods exist to restore the ECM.

In most instances, simply retrying the flash process will return the ECM to working order.

In the instance where tuners apply security restrictions to a tune file, including locking to the controller serial number, and the flash fails, you must try to recover the ECM with a file that has no security restrictions in place (e.g. stock tune) before attempting to reflash a file with security restrictions.

If retrying the flash process does not return the ECM to working order, the Problem Flashing a Controller and Controller Recovery knowledgebase articles provide additional support resources.

Test for Rogue Modules

For Customers with FlashScan/AutoCal V3 a range of test modes to check the network for rogue modules that may cause read or flash operations to abort are available.

Navigate to the Tune Tool -> F1: Tuning -> F4: Test OBD Network menu.

Select the Test CAN J1979 option for CAN based controllers.

Select the Test VPW 1x Speed option for VPW based controllers to test the network at normal speed, i.e. data logging speed.

Select the Test VPW 4x Speed option for VPW based controllers to test the network at the speed used to read or flash a controller.

Trace Files

V8 Scan and Tune *.htx files

When V8 Scan and Tune software reads or flashes a controller the details of the read/flash process may be saved in trace files for diagnostic purposes.

In addition, users can manually save trace files where options do not perform the desired outcome.

To manually generate a trace file, generate the error in V8 software, then open the EFILive Control Panel and navigate to [F8: Trace] and select [Save Trace]. Users can set the trace file and save location during this process.

Automatically generated trace files are created on your PC or laptop in the folder: \Documents\EFILive\V8\Trace and are named using the following naming convention:

YYYYMMDD_HHNNSS_T_CCC.htx, where:

- YYYYMMDD: is the year, month and day that the trace was recorded.
- HHNNSS: is the hour, minute and second that the trace was recorded.
- T: is the mode and is one of **R**=Read **F**=Full-Flash **W**=Cal-Flash.
- CCC: Is the controller type
- htx: is the file extension.

FlashScan/AutoCal V3 *.xalm files

Trace files are automatically saved where an error message is presented using the device in BBX mode. Users can manually save trace files where options do not perform the desired outcome, including for pass-thru functions.

To manually generate a trace file on FlashScan/AutoCal V3 navigate to Scan Tool -> F3: Scan Options -> F1: Save Trace.

FlashScan/AutoCal V3 maintains an internal buffer of the most recent messages sent to and received from the vehicle. That buffer is stored in RAM memory and is wiped clean each time the device is powered off or rebooted. Therefore you MUST save the trace file before powering off or rebooting the device.

Trace files are located in the EFILive -> Trace folder on FlashScan/AutoCal V3. Trace files are named using the following naming convention:

yyyymmdd_hhnnss_<desc>.xalm, where:

- yyyymmdd: is the year, month and day that the trace was recorded.
- hhnnss: is the hour, minute and second that the trace was recorded.
- <desc>: is the description where;
  - “User” means user generated trace files
  - “xxx._x_$xxxx” identifies the 3 character controller ID, the communication process upload/download, and the 4 digit error code.
- xalm: is the file extension.

FlashScan V2 Trace Files

Trace files are automatically saved where an error message is presented using the device in BBX mode. Users can manually save trace files where options do not perform the desired outcome.

To manually generate a trace file on FlashScan V2 navigate to F1 Scan Tool -> F3 Scan Options -> F1 Save Trace File.

FlashScan V2 maintains an internal buffer of the most recent messages sent to and received from the vehicle. That buffer is stored in RAM memory and is wiped clean each time the device is powered off or rebooted. Therefore you MUST save the trace file before powering off or rebooting the device.

Trace files are located in the Scan folder on FlashScan V2. It will be named USR_xxxx.efx, where xxxx is the unique file counter number.

AutoCal V2 Trace Files

Provided enough space exists in the [Data] file system of AutoCal V2 trace files are automatically saved where an error message is presented using the device in BBX mode. Users can manually save trace files where options do not perform the desired outcome.

To manually generate a trace file on AutoCal V2 navigate to:

1. AutoCal (standard menu): Save Trace File
2. AutoCal (advanced menu): Scan Tool -> Save Trace File

AutoCal V2 maintains an internal buffer of the most recent messages sent to and received from the vehicle. That buffer is stored in RAM memory and is wiped clean each time the device is powered off or rebooted. Therefore you MUST save the trace file before powering off or rebooting the device.

The trace file will be saved in the Scan folder on the device. It will be named USR_xxxx.efx, where xxxx is the unique file counter number.

Knowledgebase

The EFILive Knowledgebase provides a detailed resource on how to configure and use your EFILive software and hardware.

EFILive Authorized Dealer

If after reviewing this guide further assistance is required please contact the EFILive Authorised Dealer from whom you purchased your product. They are your first point of contact for EFILive support related inquiries.

How to Tune?

EFILive is tuning software and hardware - it is not a tune. Together the software and hardware give users the tools to write tunes. EFILive does not provide tune files, tuning advice or support, but do provide software support and hardware support.

If your question is in relation to the actual tuning of your vehicle (e.g. how to gain performance, economy etc.) then please ask these questions on the EFILive Forum (http://forum.efilive.com/).

EFILive Service Desk

Should you require additional assistance after using this support guide, please start a ticket on the EFILive Service Desk. Please include the following information:

1. Dealer Name.
2. Device type.
3. Serial Number and Auth Code.
4. Your computer operating system.
5. Software and firmware versions.
6. Trace files.
7. Detailed information about your issue.