



# Duramax 2.8L E98 DSP<sup>4</sup> User Guide

Cindy Myers

# Duramax 2.8L E98 DSP<sup>4</sup> User Guide

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## Prerequisites

### Intended Audience

EFILive Customers upgrading to DSP<sup>4</sup> switchable tuning for E98 2.8L Duramax.

### 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:

- GM Diesel Tuning and diagnostics.



## Introduction

### What is DSP<sup>4</sup>?

EFILive's DSP custom operating systems for the E98 GM Diesel ECM allows customers to be able to switch 'on the fly' between multiple tunes, all stored in the ECM's flash memory. ECM memory defines the number of tunes that are available for switching.

Having multiple tunes instantly accessible means changing tunes to suit different driving conditions no longer requires the ECM to be reflashed each time you choose to run a different tune. (E.g. racing, towing, or power limiting.) Simply build up all the tunes you need, flash the ECM once and then select your desired tune through your EFILive hardware (or other approved switching devices) at any time.

### Additional Support Resources

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

If your question is in relation to the actual tuning of your vehicle (i.e. how to gain performance, economy etc.) then please ask these questions on the EFILive Forum (<http://forum.efilive.com/>). EFILive does not provide support or assistance for the actual tuning of any supported vehicles.

### Software Version Overview

EFILive presently has two major software versions (V8 and V7) that service different parts of the tuning and scanning process. The V8 software is undergoing significant development and will eventually supersede V7 entirely for FlashScan customers. E98 customers must install both versions, the following table displays E98 software functionality.

Feature	V7	V8
Scanning	✓	✓
OBDII Diagnostics	✓	✓
Reading	✗	✓
Flashing	✗	✓
Tune Editing	✓	✗
VIN License Management	✗	✓
Firmware Management	✗	✓
Congifure FlashScan V2/AutoCal for DSP <sup>4</sup> tune switching	✗	✓



## DSP<sup>4</sup> Upgrade

### DSP<sup>4</sup> Upgrade Checklist

DSP<sup>4</sup> conversion files are only available for on selected factory ECM Operating Systems (OS's).

Operating System #	
55484589	55503875
55488069	55503892
55491998	55597308
55493455	

If the truck has had a different tuner on it in the past (i.e. not EFILive) then the conversion process may fail. EFILive highly recommends Customers source a good known base file for DSP<sup>4</sup>. This may involve either a dealer flash, or obtaining a suitable file from your chosen tuner.

EFILive cannot always detect the presence of other tuners in files, if a situation occurs where EFILive's modifications 'clash' with other tuners modification it might result in a bricked 'brain dead' ECM that cannot be recovered.

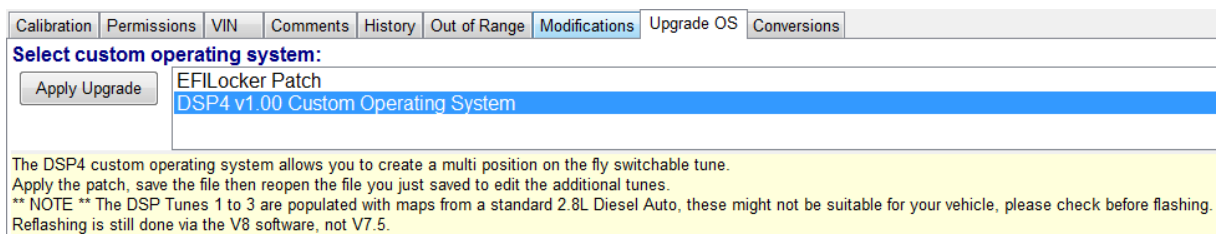
To upgrade to DSP<sup>4</sup>, the minimum software requirements are:

1. EFILive V8.2.5.319 or later
2. FlashScan V2 / AutoCal Firmware - V2.07.116
3. EFILive V7.5.10.327 or later

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

### Upgrade Operating System to DSP<sup>4</sup>

1. Connect FlashScan V2 to your PC, and open V7.5 Tune Tool.
2. Open you E98 tune and click on the 'Upgrade OS' tab.



3. Select the 'DSP<sup>4</sup> v1.XX Custom Operating System' option and click on the 'Apply Upgrade' button.
4. Save the file with a new name, **File > Save As**. Maybe something like "My Truck Base DSP4 Conversion.ctz".
5. Close the file using **File > Close Tuning File**.

6. Reopen the file so EFILive will recognise the file is a DSP<sup>4</sup> converted operating system. Please take note of the new operating system (OS) number of the DSP<sup>4</sup> converted file. E.g., 55597308 now becomes 65597308

Calibration Identifiers:			
OS:	65597308	OS ID:	AA
Calibration:	N/A	BCC:	N/A
Calibration Definition File (*.cal):			
Name:	65597308.calz		
Version:	7.03	Date:	October 23rd, 2015

EFILive automatically populates the new DSP<sup>4</sup> tables with factory pickup truck values during the upgrade to get you started. On modified engines these may not be suitable settings, you may need to copy your own tables in to the new DSP<sup>4</sup> section(s).

Any existing tables from your old converted tune are now located in the "DSP<sup>4</sup> Program #4" folder.

Once you have made the necessary changes (or even if you do not make changes) to your individual tunes, save the tune file again and **FULL FLASH** the ECM using V8 Scan and Tune. The Full Flash only needs to be done once to get the new DSP<sup>4</sup> OS in to the ECM, calibration only flashing is all that is needed for additional tuning changes to any of the switchable maps.

Full Flash is required to revert to a factory operating system (single tune).

## Tune Features of DSP<sup>4</sup>

All tune features of DSP<sup>4</sup> are accessible via the V7 Tune Tool application.

### Tune Switch Password

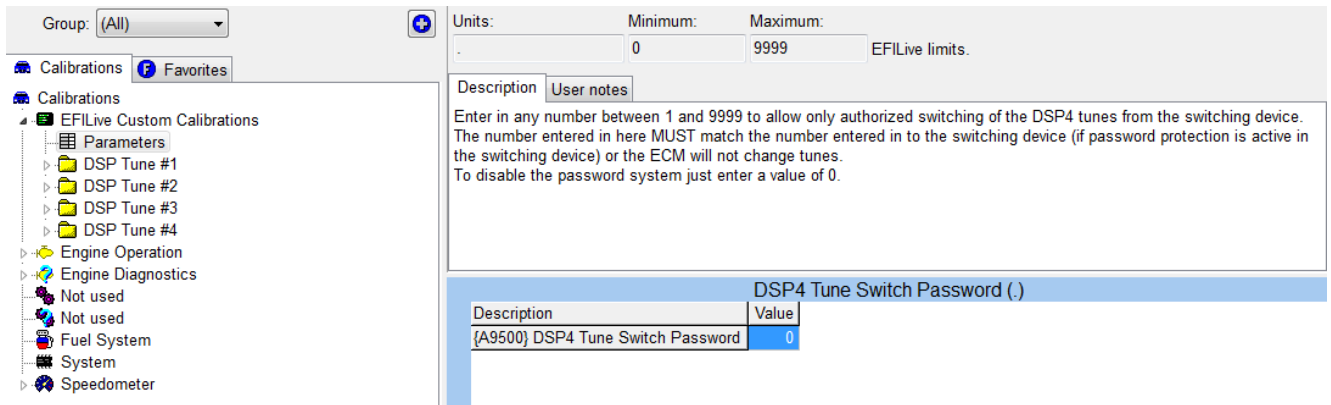
Users may restrict tune selection by adding a password to move between tune selections to prevent unauthorized switching between tunes 1 to 4.

Before switching between tune selections, users would need to enter in the password (1 to 9999). If the password is correct, the tune will switch, if it is incorrect the tune will not switch.

It should be noted that not all switching devices may support this function, however EFILive's own FlashScan and AutoCal hardware does.



To enable the tune switch password, users need to input their chosen password in the calibration. As the calibration description states, if the password = 0 then there is no password prompt given to the user when switching tunes.



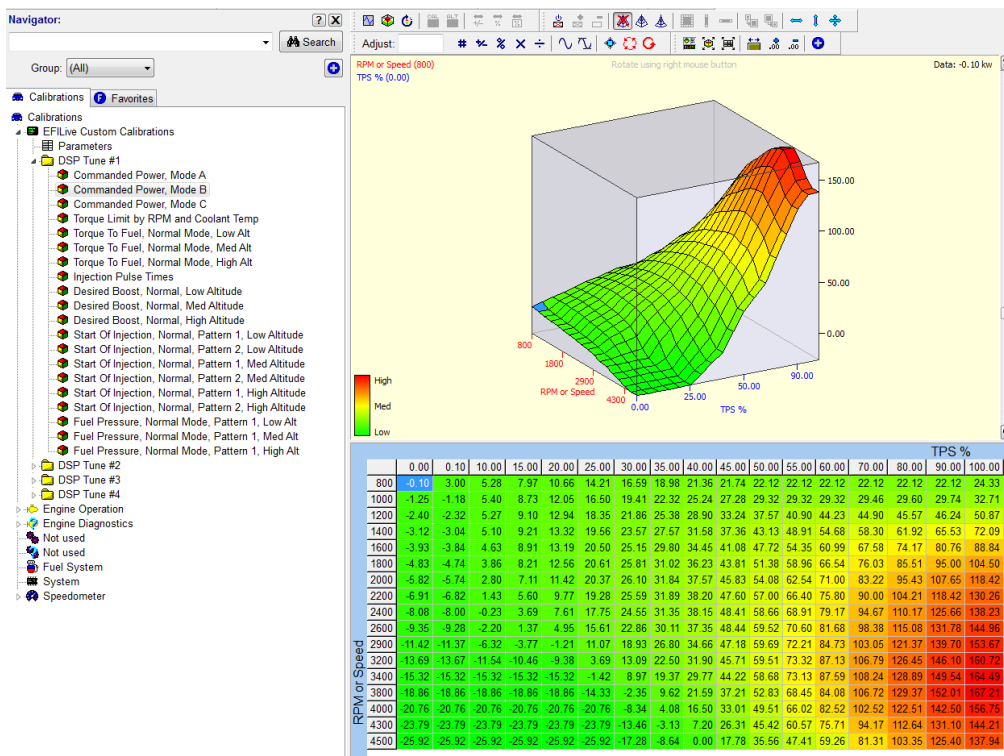
### DSP4 CAN Tunes

The DSP4 tunes labelled "Program #1 to Program #4" are all switched via a device on the CAN bus.

Each one of these programs has duplicate sets of tables for you to alter. Program #1 to Program #3 have some 'stock' values inserted in to the maps; Program #4 contains the values you already had in the standard OS maps prior to the DSP4 conversion.

When the DSP4 OS conversion is performed the new tables are populated with maps from a standard pickup truck, these may not be suitable for your vehicle, especially if your vehicle has been modified. Please review and change as necessary the default maps in all the DSP4 tunes before starting and driving the vehicle.

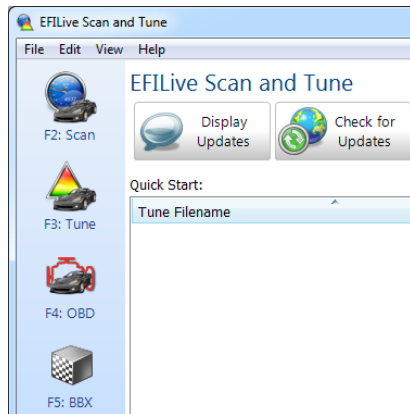
It should be noted that whenever the ECM is reflashed it may default to using DSP4 Program #1.



## Setting up FlashScan V2/AutoCal for DSP<sup>4</sup> using V8 Scan and Tune

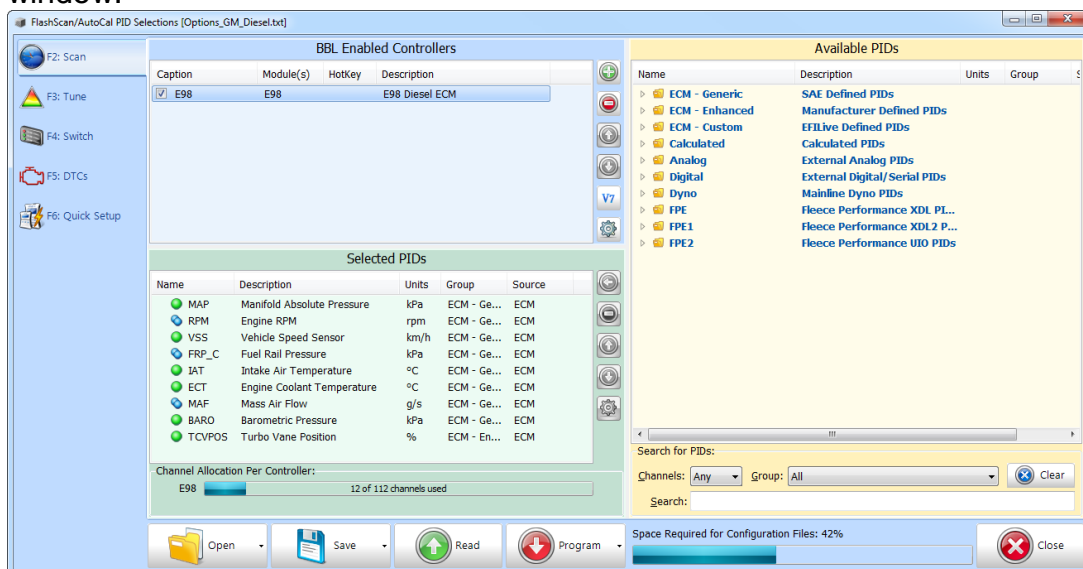
There are a range of configuration files that need to be programmed onto FlashScan V2 and AutoCal to enable hardware to work in standalone mode for your controller. Each step can be programmed into the device individually, or collectively.

With your FlashScan V2/AutoCal plugged in to a USB port, open V8 Scan and Tune and click on the [F5: BBX] option.



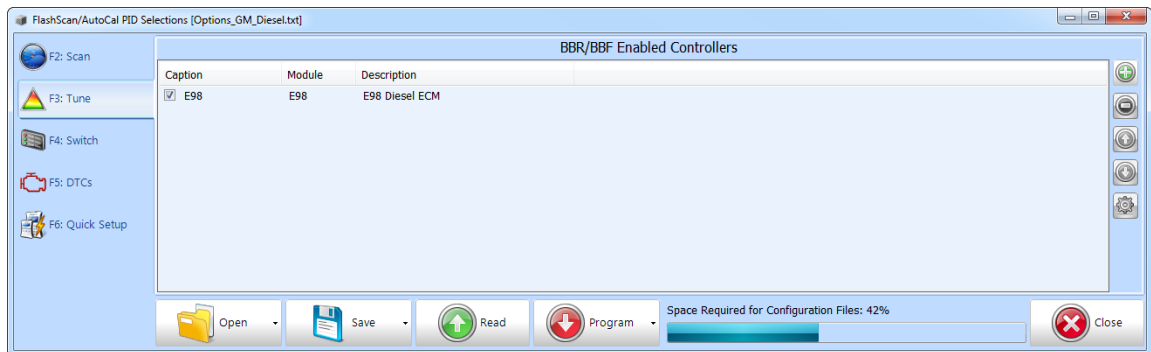
### BBL (Black Box Logging) Configuration

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 or Transmission Controller box.
  - c. Click on a selected controller.
  - d. Read and accept the BBL information display.
  - e. Select OK.
4. Navigate and select **Available PIDs** to facilitate logging.
5. Drag PID selections from the **Available PIDs** window into the **Selected PIDs** window.



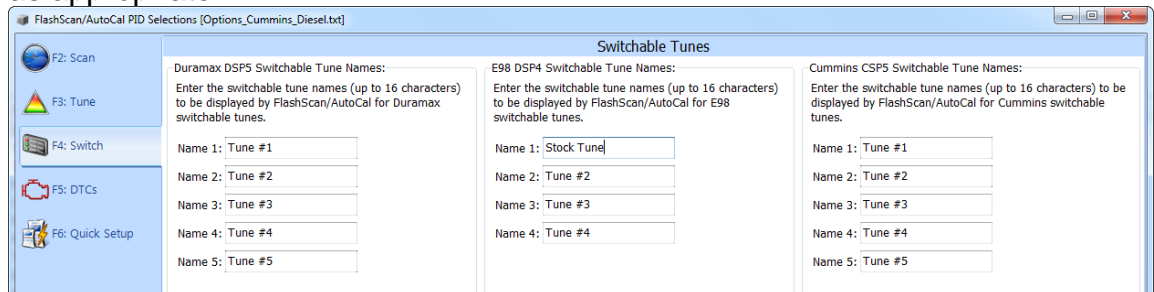
## BBR & BBF (Black Box Reading and Flashing) Configuration

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 or Transmission Controller box.
  - c. Click on a selected controller.
  - d. Select OK.



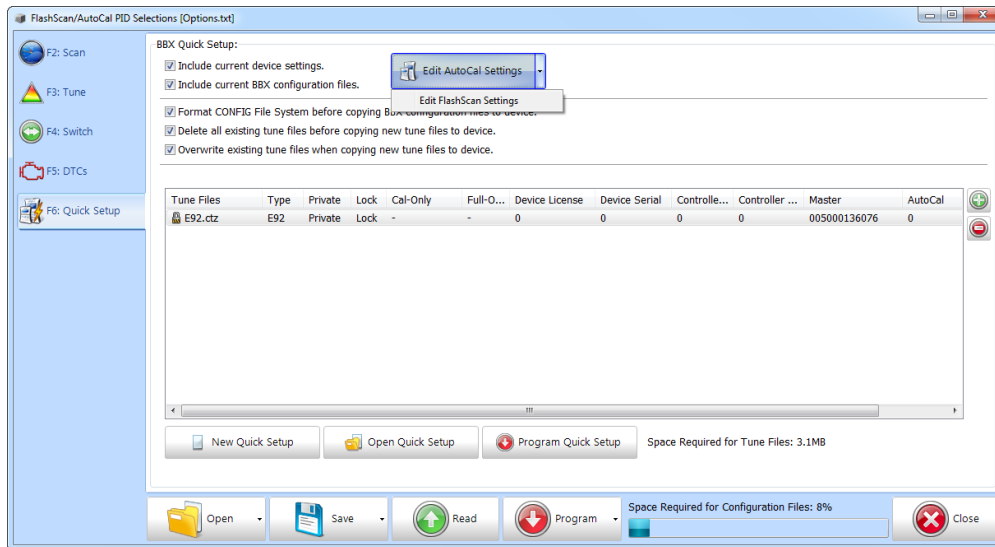
## Switchable Tune Configuration

1. Select the **[F4: Switch]** option in the left-hand pane.
2. Enter switchable tune names you wish to display on FlashScan V2/AutoCal as appropriate.

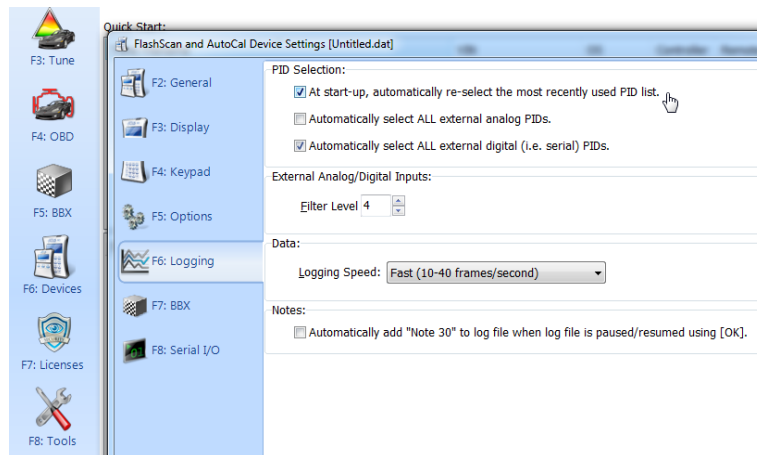


## Quick Setup

1. Select the **[F6: Quick Setup]** option in the left-hand pane.



2. Edit **FlashScan V2** or **AutoCal** Settings as required. Ensure that tunes can be switched after powering off FlashScan V2/AutoCal by selecting
  1. **[F6: Logging]** → **At start-up, automatically re-select the most recently used PID list.**



3. Select appropriate **BBX Quick Setup** options.
4. Add tune files to the **Quick Setup** using the green '+' icon.

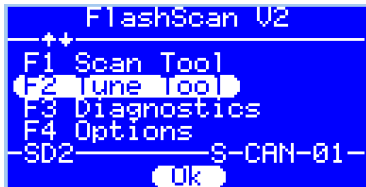
Write this configuration to **FlashScan V2** or **AutoCal** using the **[Program Quick Setup]** function. The **[Program Quick Setup]** programs all selected Scan, Tune, Switch options, as well as selected device settings, BBX Quick Setup selections and tune files. Once the device is programmed, **FlashScan V2** or **AutoCal** is configured for BBX functions and tune switching via FlashScan V2 or AutoCal.

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

## Switching Tunes with FlashScan V2/AutoCal

To switch tunes via the FlashScan V2/AutoCal, the device must first be configured for switching, and a DSP<sup>4</sup> tune file flashed into the ECM. Once configured, and a DSP<sup>4</sup> tune file is flashed into the ECM navigate to: (FlashScan V2 samples shown)...

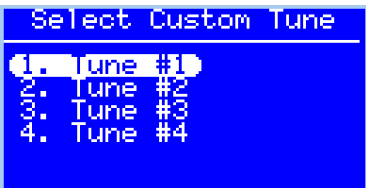
1. Select **F2 Tune Tool**.



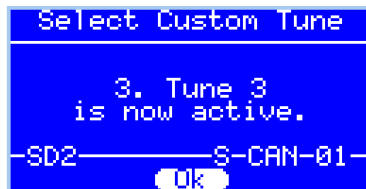
2. Select **F3 Switchable Tunes**.



3. Arrow between tune selections.

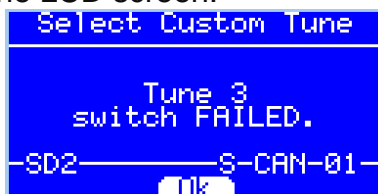


4. Select the 'Ok' button to select that tune. If it was successful you should see confirmation of that on the screen.



You do not need to reselect the tune once the engine is shut down; the ECM 'remembers' which tune you previously selected.

Occasionally the ECM and FlashScan V2/AutoCal may get out of sync when switching tunes if the trucks ignition was turned off but the FlashScan V2/AutoCal remained powered up. When this occurs the following message will be displayed on the LCD screen.



If you do see that error simply try to switch the tune again.

## Switching Tunes via EFILive DSP<sup>4</sup> App

EFILive's DSP<sup>4</sup> phone application is designed to allow those users who have installed EFILive's DSP<sup>4</sup> custom operating system in their vehicle to change tunes on the fly using their phone / tablet connected to an OBD-II Bluetooth adaptor as an alternative to switching tunes via hardwired switch or EFILive hardware.

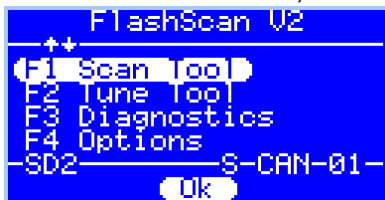
The [EFILive DSP<sup>4</sup> App](#) is a free download from the Google Play store.

This application also incorporates an idle speed override function which is not available using other switching methods. Idle speed override allows temporarily control over engine idle speed; most likely to be used when using an electric winch.

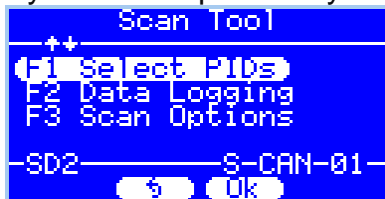
Refer to the [Duramax E98 DSP<sup>4</sup> App User Guide.pdf](#) for requirements.

## Data Logging with FlashScan V2/AutoCal

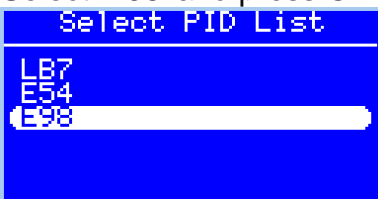
1. From the Main Menu, choose **F1 Scan Tool**.



2. If you haven't previously select the E98 PID list you need to do so.



3. Select 'E98' and press Ok



**Please note:** When data logging is activated you cannot return to the tune selection menu unless logging is stopped.

## Integrating DSP<sup>4</sup> with Approved 3<sup>rd</sup> Party Products

Integration of EFILive's proprietary DSP<sup>4</sup> custom operating system with 3<sup>rd</sup> party products is restricted to approved providers, many of which are listed on the [www.efilive.com](http://www.efilive.com) website. EFILive recommends that customers confirm that their chosen integration product is approved for use.

To setup an approved integration product, users should:

1. Convert their base file to a DSP<sup>4</sup> operating system, as described in this document.
2. Edit tune parameters as necessary and save the file using the V7 Tune Tool application, as described in this document.
3. Flash their modified file into their ECM using the V8 Scan and Tune application as described in this document. (Specific selection of 3<sup>rd</sup> party product is NOT required in tune file).
4. Setup the 3<sup>rd</sup> party device as per the manufacturer's instructions.

## Troubleshooting

Should users encounter problems with upgrading to DSP<sup>4</sup> they should:

1. Confirm V7, V8 firmware and bootblock versions match the DSP<sup>4</sup> minimum requirements (listed above) using these instructions [Finding FlashScan & AutoCal Bootblock and Firmware versions](#)
2. Confirm DSP<sup>4</sup> file was upgraded to new operating system number, as sequenced above.
3. If you require assistance in reading, flashing or editing tuning parameters on your controller it is recommended you refer to the [EFILive V8 Reference](#) which can be found in your V8 installation under documents, or the Documentation section of the EFILive website.
4. If you require assistance in setting up FlashScan V2 or AutoCal standalone features (BBX), it is recommended you refer to the [EFILive V8 Reference](#).
5. If you are concerned your device is not switching between tunes, edit your tunes to see a notable difference (i.e. Pedal to Desired Fuel table), reflash and then test. Also note the EDA data stream has a parameter that indicates which tune the ECM is running.