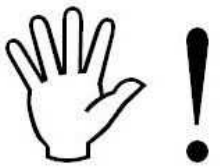
Instruction Manual

PERFORMANCE ELECTRONICS

AEM Infinity
V96.2 Update Notes



STOP!

THIS PRODUCT HAS LEGAL RESTRICTIONS.
READ THIS BEFORE INSTALLING/USING!

WARNING! THIS IS A RACE ONLY PRODUCT MANUFACTURED AND SOLD FOR INSTALLATION ON VEHICLES DESIGNED TO BE USED SOLELY FOR COMPETITION PURPOSES. ONCE THIS PART IS INSTALLED, THE VEHICLE MAY NEVER BE USED, OR REGISTERED OR LICENSED FOR USE, ON A PUBLIC ROAD OR HIGHWAY. IF YOU INSTALL THIS PART ON YOUR VEHICLE AND USE THE VEHICLE ON A PUBLIC ROAD OR HIGHWAY, YOU WILL VIOLATE THE CLEAN AIR ACT AND MAY BE SUBJECT TO PERSONAL CIVIL OR CRIMINAL LIABILITY, INCLUDING FINES OF UP TO $4,819 PER DAY.

IT IS THE RESPONSIBILITY OF THE INSTALLER AND/OR USER OF THIS PRODUCT TO ENSURE THAT IT IS USED IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IF THIS PRODUCT WAS PURCHASED IN ERROR, DO NOT INSTALL AND/OR USE IT. THE PURCHASER MUST ARRANGE TO RETURN THE PRODUCT FOR A FULL REFUND.

THIS POLICY ONLY APPLIES TO INSTALLERS AND/OR USERS WHO ARE LOCATED IN THE UNITED STATES; HOWEVER CUSTOMERS WHO RESIDE IN OTHER COUNTRIES SHOULD ACT IN ACCORDANCE WITH THEIR LOCAL LAWS AND REGULATIONS.

WARNING: This installation is not for the tuning novice! Use this system with EXTREME caution! The AEM Infinity Programmable EMS allows for total flexibility in engine tuning. Misuse or improper tuning of this product can destroy your engine! If you are not well versed in engine dynamics and the tuning of engine management systems DO NOT attempt the installation. Refer the installation to an AEM-trained tuning shop or call 800-423-0046 for technical assistance.

NOTE: All supplied AEM calibrations, Wizards and other tuning information are offered as potential starting points only. IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM IF THE CALIBRATION IS SAFE FOR ITS INTENDED USE. AEM holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

AEM Performance Electronics
AEM Performance Electronics, 2205 126th Street Unit A, Hawthorne, CA 90250
Phone: (310) 484-2322 Fax: (310) 484-0152
http://www.aemelectronics.com
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**********CAUTION**********

The Infinity ECU contains two separate microcontrollers, a primary and a peripheral controller. The v96.2 update includes a firmware change for the peripheral microcontroller as well as the primary. ***The new peripheral microcontroller firmware is not compatible with certain older primary microcontroller firmware.***

- This means that once the new v96.2 pakgrp file is loaded, you cannot simply reload a pakgrp file older than v96.1 in one step. ***Reverting to an older version requires a two step process.***
- Pakgrp files prior to the v96.1 update did not contain peripheral microcontroller firmware as this file is loaded onto the hardware as part of the final QC process at AEM.
- The ECU will not function properly if certain old pakgrp files are reloaded after upgrading to a v96.2 pakgrp. The ECU will not respond correctly to the ignition switch input.

In the unlikely event that a pakgrp file older than v96.1 must be loaded, you must follow a two step process. First, the ECU must be updated with a different peripheral microcontroller firmware version that is compatible with older primary microcontroller firmware versions. Next, the older pakgrp file can be loaded. The legacy version of the peripheral microcontroller firmware is available at aeminfinity.com. The procedure is included in the Troubleshooting section.

ECU P/Ns 30-7100 serial numbers 230 and below
ECU P/Ns 30-7101 serial numbers 142 and below

If your ECU falls into this range, the legacy peripheral microcontroller firmware file must be loaded first before proceeding to load any other v96.2 firmware file.
**********CAUTION**********
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Upgrade Feature/Change Summary

This incremental update will add features and improve functionality of the base v96 firmware. Several new timing patterns have been added along with CAN receive support for AEM's new line of X-Series products. The firmware update dialog functionality has been improved to work better with inconsistent PC connections. Power sequencing response to noisy ignition switches has been improved. Several changes were made to Infinity Tuner that improve usability.

New vehicle/application timing support:

- 2004-2006 Suburu WRX STI
- 2009-2012 GEN 3 Hemi
- 2013 and newer GEN 3 Hemi

Bug Fixes:

- Fixed a problem that sometimes occurred during the firmware upgrade process where the PC would not reconnect with the ECU consistently.
- Fixed a coil output problem that caused one or more coil output waveforms to drop out under very specific engine acceleration rates and certain ignition timing and dwell values.
- Fixed a problem causing the Infinity Tuner controls to 'flash' while being edited.
- Infinity-508 now includes VW 1.8T CAN dash control support.
- Power sequencing features adjusted to respond more consistently to electrically noisy ignition switch inputs. This would sometimes cause the ECU to hang ON when the ignition switch was turned OFF.
- Ford Coyote timing pattern support adjusted to allow more speed variation during cranking. This makes it easier to start certain high compression engines.

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- Fixed a bug that may have allowed a small amount of fuel to flow through injectors 7, 8, 9 or 10 even though the injector may have been disabled using the Setup Wizard Coils/Injectors page.
- Fixed a bug in the CAN transmit function. Error flags for throttle, coolant temp, MAP and certain other sensors were not functioning as intended. Ethanol content was transmitting incorrect scaling.

Compatibility with old layouts:
New models and session files should be compatible with older layouts. There were no channel naming changes to break existing layouts.

v96.2 Models/Tuning Changes:
- Add support to receive AEM X-Series CAN messages.
- Additional digital inputs now allowed for 3StepSwitch and ShiftSwitch tables.
- VTEC logic adjusted to avoid high RPM cycling on certain applications.
- LeanProtect function now allows the use of Lambda3/4 external inputs.

v2.96 Infinity Tuner Changes:
- Admin level automatically detected. User notified if changes are necessary to allow USB port access and connectivity.
- New feature adding dedicated save paths for layouts, sessions, logs and themes.
- Auto save log path now displayed in the window header.

v2.96 Setup Wizard Changes:
- Fuel properties now exposed in Setup Wizard allowing the user to adjust specific gravity and stoichiometric ratio individually.

Description of files available on aemfinity.com
The following example shows a typical list of available files on aeminfinity.com. This particular examples shows files available for an Infinity-506 ECU (part number 30-7106).

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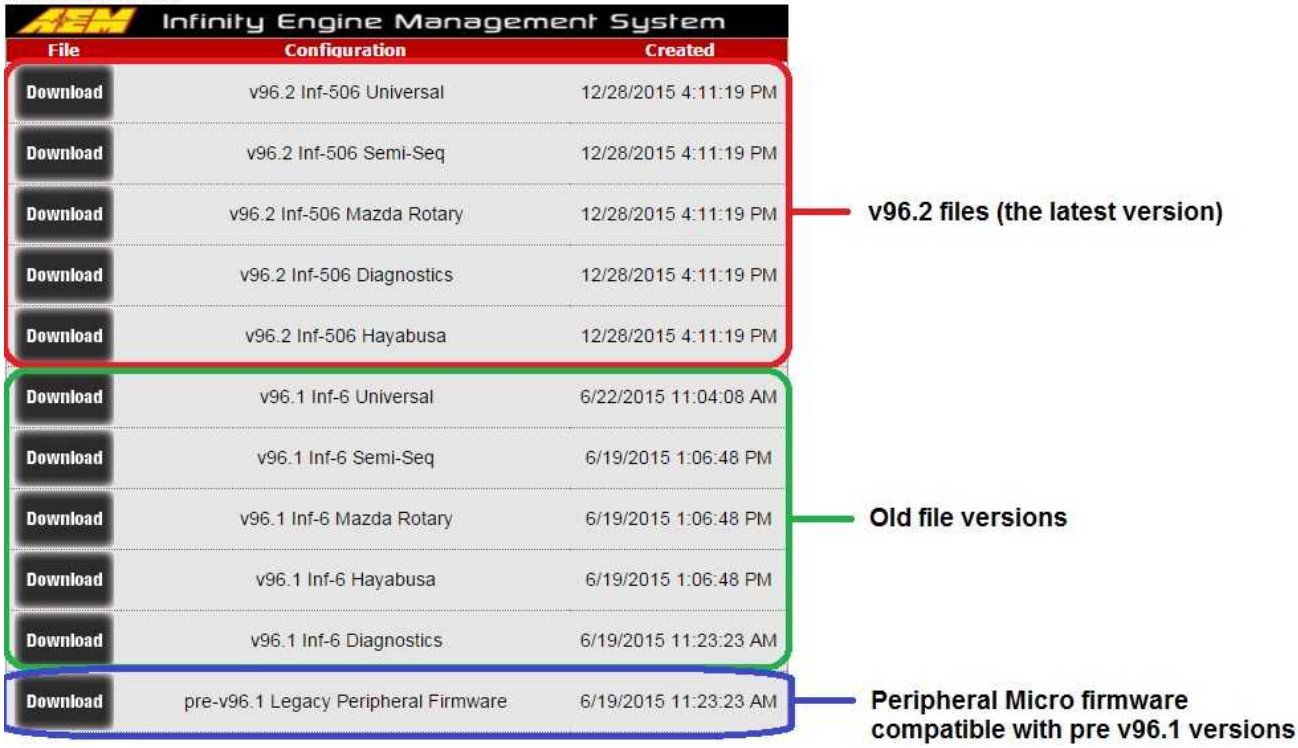
Available Software:



The files listed in the top highlighted box are the latest files with all latest features available for this hardware platform. There are four options.

1. v96.2 Inf-506 Universal - A universal pakgrp file that will work on a wide variety of different sequentially injected applications supporting up to 6 injectors and 6 coil outputs.

2. v96.2 Inf-506 Semi Seq - Same universal above but able to support semi-sequential injection setups with no cam sync

3. v96.2 Inf-506 Mazda Rotary - Same as universal above but able to support certain unique hardware I/O requirements of the Mazda rotary engine

4. v96.2 Inf-506 Diagnostics - Unique model designed to provide custom diagnostics features for the Infinity-506 ECU.

5. v96.2 Inf-506 Hayabusa - Same as universal above but able to support certain unique hardware I/O requirements of the Suzuki Hayabusa application.

The files listed on the second highlighted box are older files still available for download for this hardware platform. They do not have the latest features.

The file listed in the third highlighted box is new peripheral microcontroller firmware that is only necessary if reverting to older firmware versions after upgrading to v96.1 or later.

Minimum computer requirements:

OS - Windows XP with .NET 4.0 framework installed

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Ram - 2GB
Processor - 1 GHz
Free HD space - 600 Mb
Connectivity - USB 2.0

All current Infinity Tuner software installations are available for download from AEM at http://www.aemelectronics.com/support/SoftwareDownloads
All current firmware pakgrp files are available for download from AEM at http://www.aeminfinity.com. ***You must download and save a valid pakgrp file before proceeding with the firmware update process.***

1. Run the setup.exe. Hit Next> and follow the instructions on each page.

2. Read and accept the terms of agreement and pick your desired location for Infinity Tuner to be installed. Hit Next> and allow the software to complete installation.

3. You may now exit the Infinity Tuner installer. You can now run Infinity Tuner.

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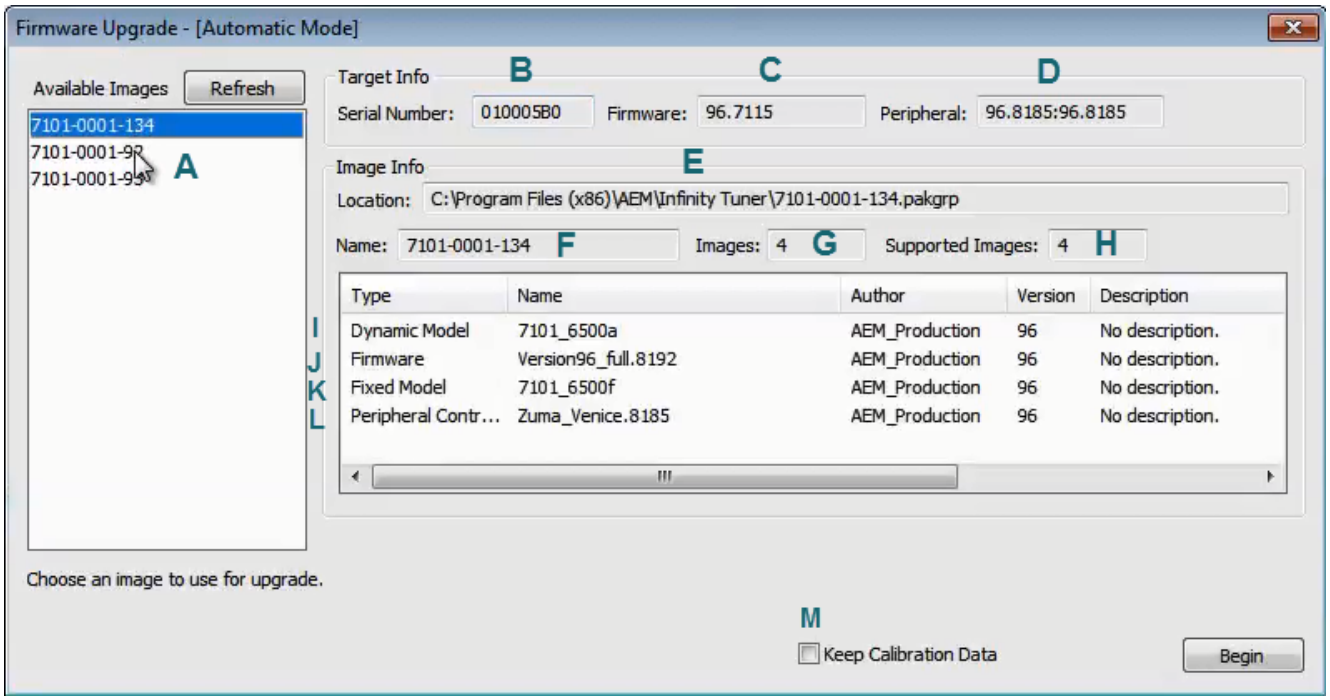
Firmware update window layout and definitions



(A) - Available Images
A list of configuration (pakgrp) files compatible with a particular ECU. Each Infinity ECU is unique. Pakgrp files from one Infinity ECU can not be used on another Infinity ECU. Several pakgrp files are usually available for each Infinity hardware part number. Selecting one of the items in this list will populate the Image Info window with the descriptions of all files contained in the pakgrp. **Appropriate files for your application must be downloaded from aeminfinity.com and saved on your PC in order to appear in this list. Only files appropriate for your ECU will be presented to you on aeminfinity.com.**

(B) - Serial Number
This is a unique hardware identifier number for the ECU. Although they are related, it is not the same as the ECU serial number included on the serial number sticker.

(C) - Firmware
The version of the firmware on the primary microcontroller in the Infinity ECU. This is not necessarily the version of the firmware being loaded into the ECU. It is the version being upgraded from. In the example image above, the firmware version currently loaded on the ECU is 96.7115. The version being loaded into the ECU is 96.8192.

(D) - Peripheral
The Infinity ECU includes two different microcontrollers that require firmware. This is the version of the firmware loaded into the peripheral microcontroller.

(E) - Location
The directory location of the selected pakgrp file

(F) - Name
The file name of the selected pakgrp file

(G) - Images

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The number of files or "images" contained within the selected pakgrp file

(H) - Supported Images
The number of valid supported images contained within the selected pakgrp file

(I) - Dynamic Model
Infinity control model files are typically broken into two parts. The dynamic model file primarily contains tuning table data and calibration constants.

(J) - Firmware
The firmware for the primary microcontroller contained within the pakgrp file. This is the version being upgraded to.

(K) - Fixed Model
Infinity control model files are typically broken into two parts. The fixed model file primarily contains control logic math expressions and non-modifiable tuning constants.

(L) - Peripheral Controller
The firmware for the peripheral microcontroller contained within the pakgrp file. This is the version being upgraded to.

(M) - Keep Calibration Data
Select to keep the existing calibration data and import it into the new configuration during the upgrade process.

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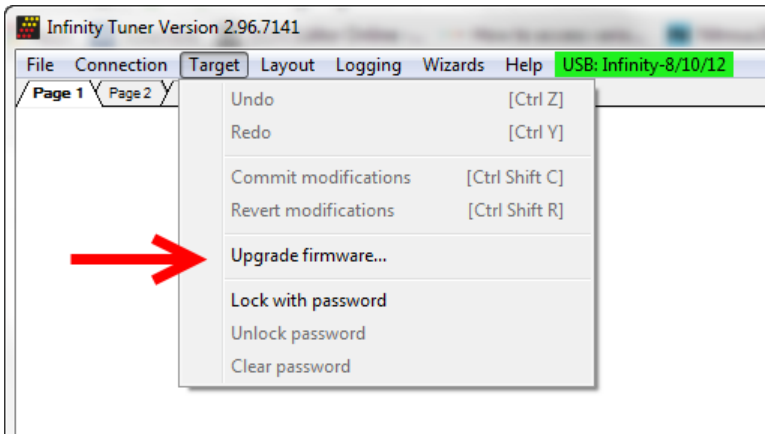
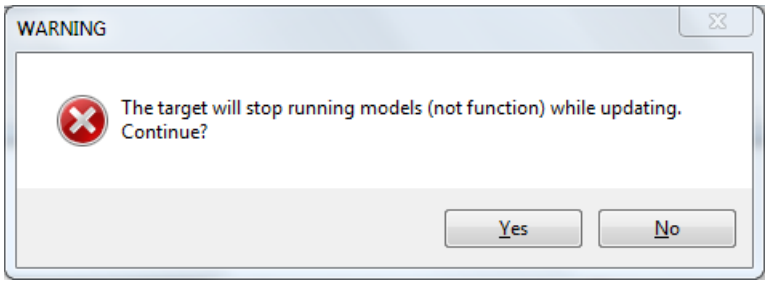


3) The ECU should not be running an engine at this time. Select “Yes” when the warning message appears.



Begin the Firmware Upgrade process.

a. Select the desired Configuration “Image” on the left.
   i. If no images are present check C:\Program Files (x86)\AEM\Infinity Tuner\ and verify .pakgrp file is there. If not, visit http://www.aeminfinity.com, log in, and download appropriate file.
b. Ensure "Keep Calibration Data" check-box is marked to save current calibration.
c. Click the “Begin” button to start the upgrade process.

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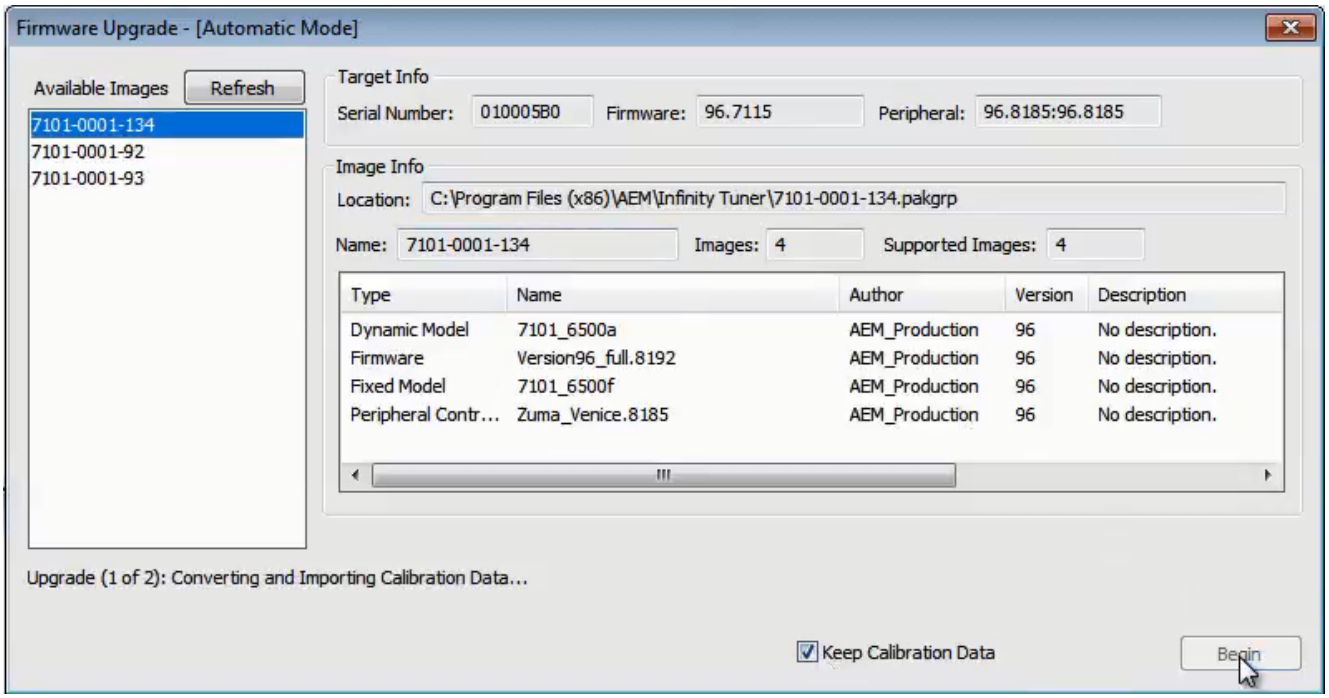
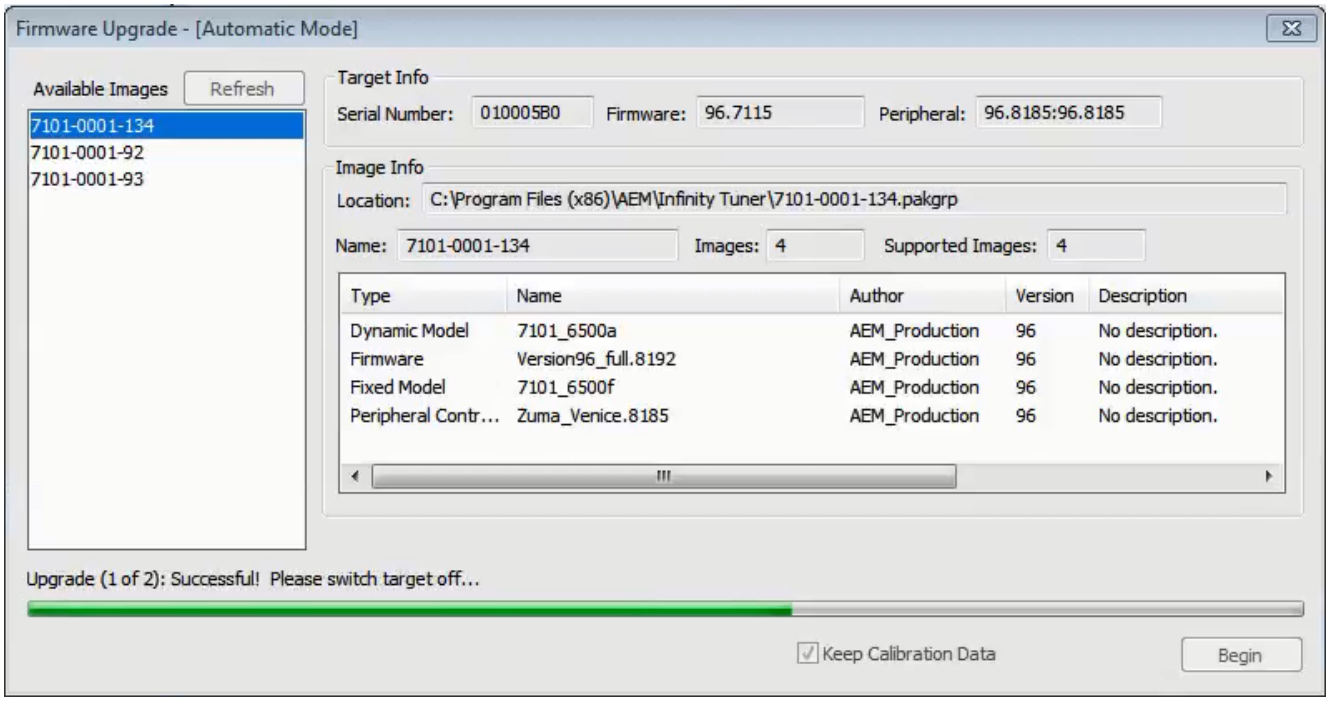


4) Follow the message at the bottom, and turn the ignition switch OFF when instructed to do so.



5) Follow the message at the bottom, and turn the ignition switch back ON when instructed to do so.

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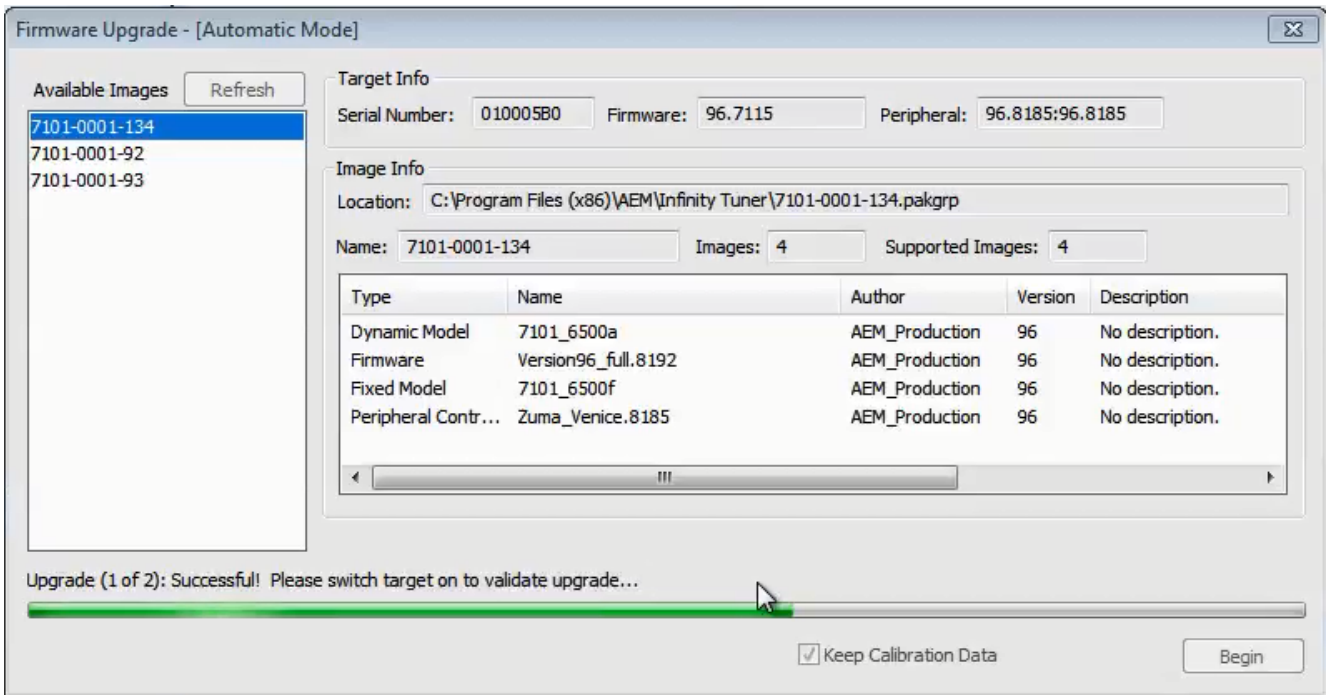
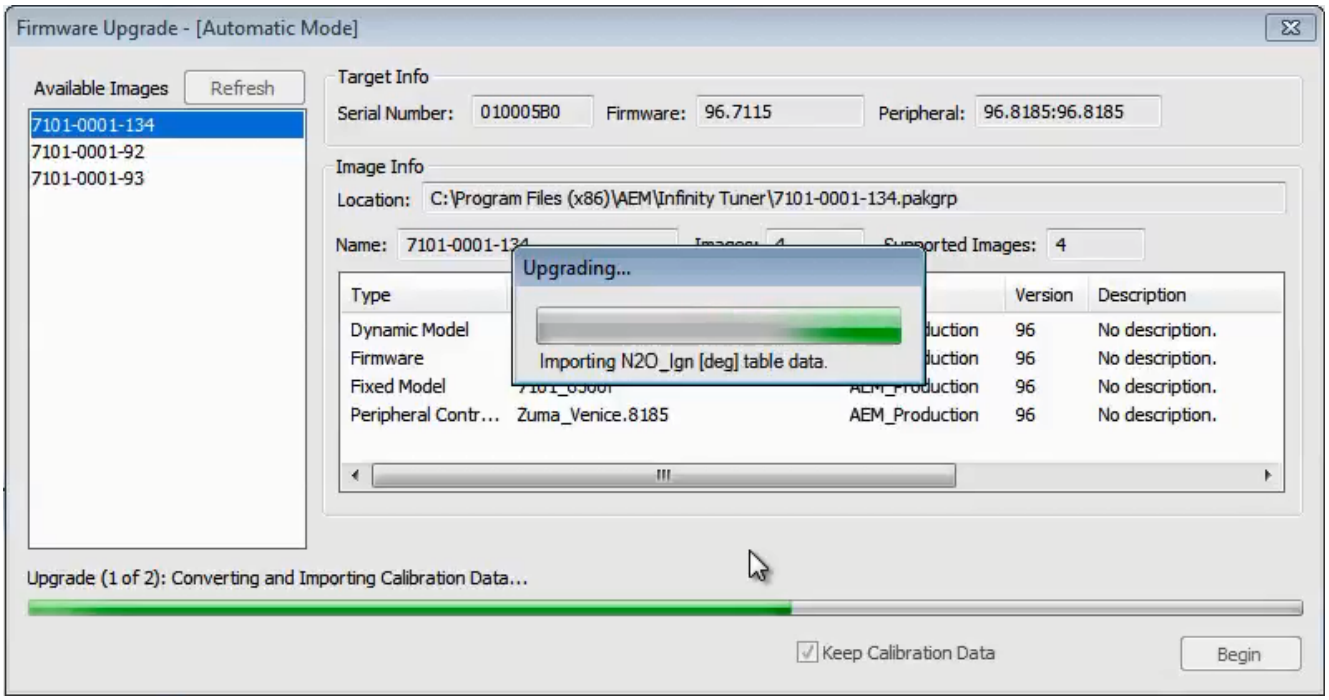


If Keep Calibration Data is checked, the system will upgrade and load all usable calibration data as shown below.



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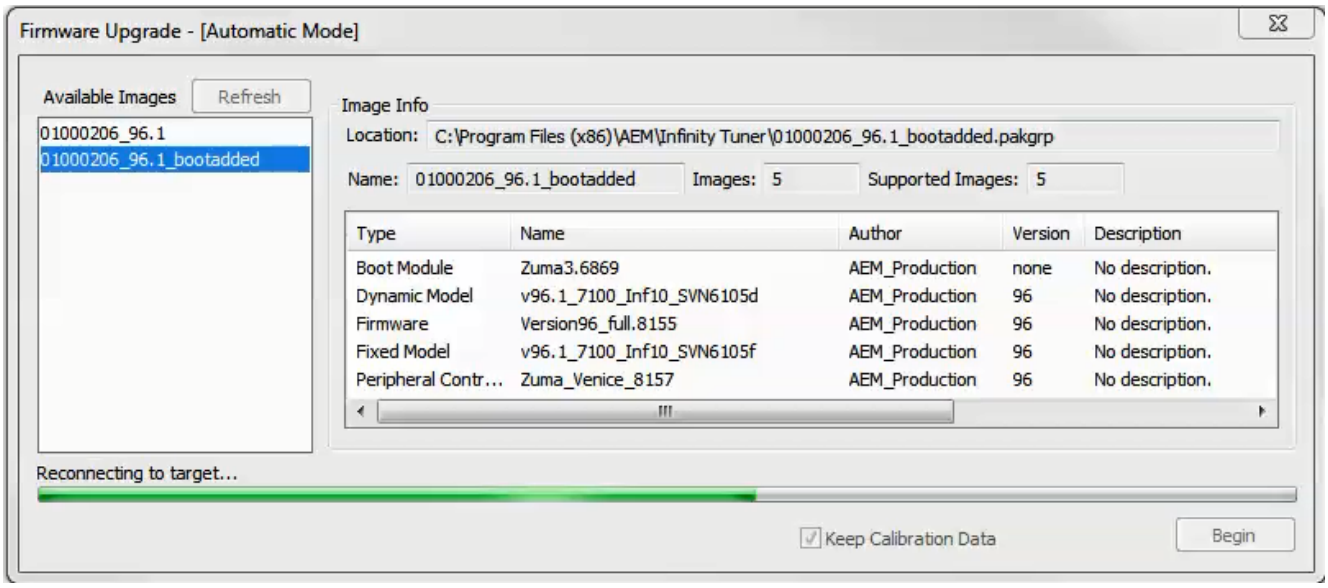
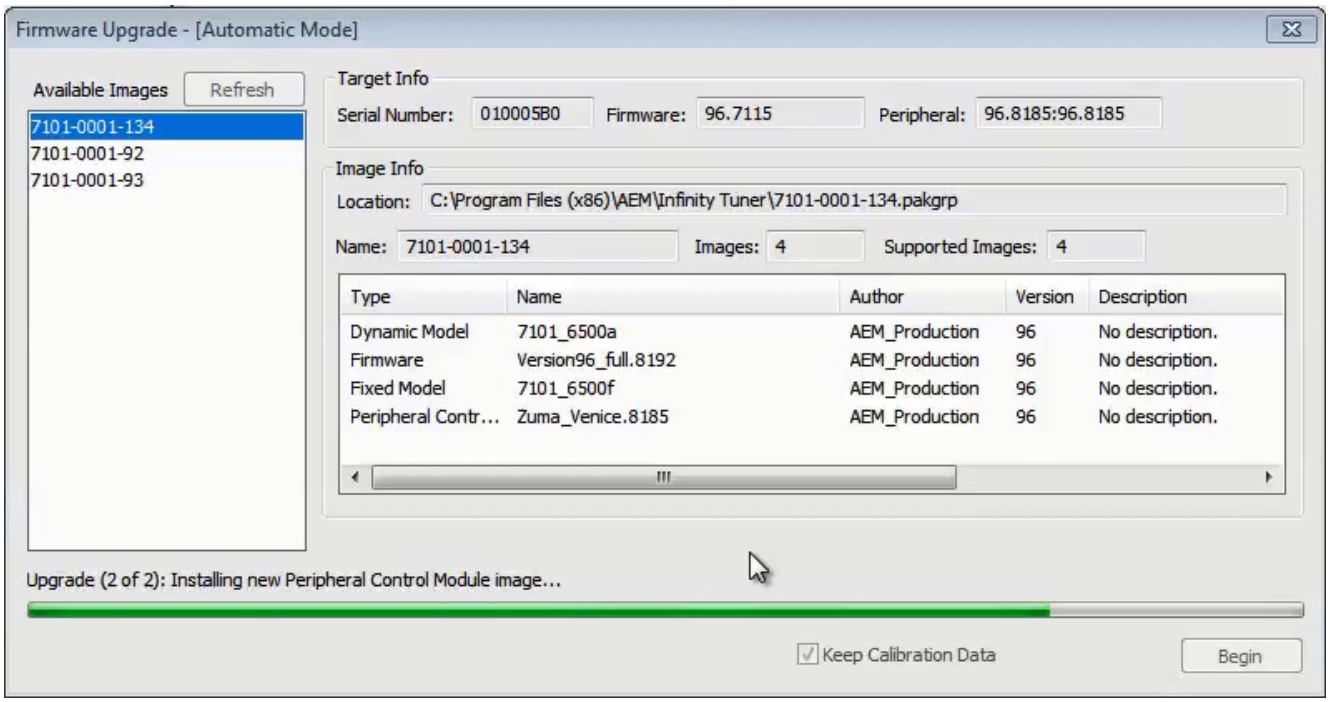


Note: at certain points in the process, the Infinity ECU will re-boot and attempt to connect with the PC. The time it takes to connect might vary for different PCs. If the process appears to hang at this stage, simply unplug and replug the USB comms connector. Often this will force the PC to re-enumerate the USB port and connect.



6. When the "Peripheral Control Module image" is updated, a full power reset may be required meaning either the battery needs to be disconnected and re-connected or all harness connectors need to be removed from the ECU for at least 5 seconds, then re-connected.

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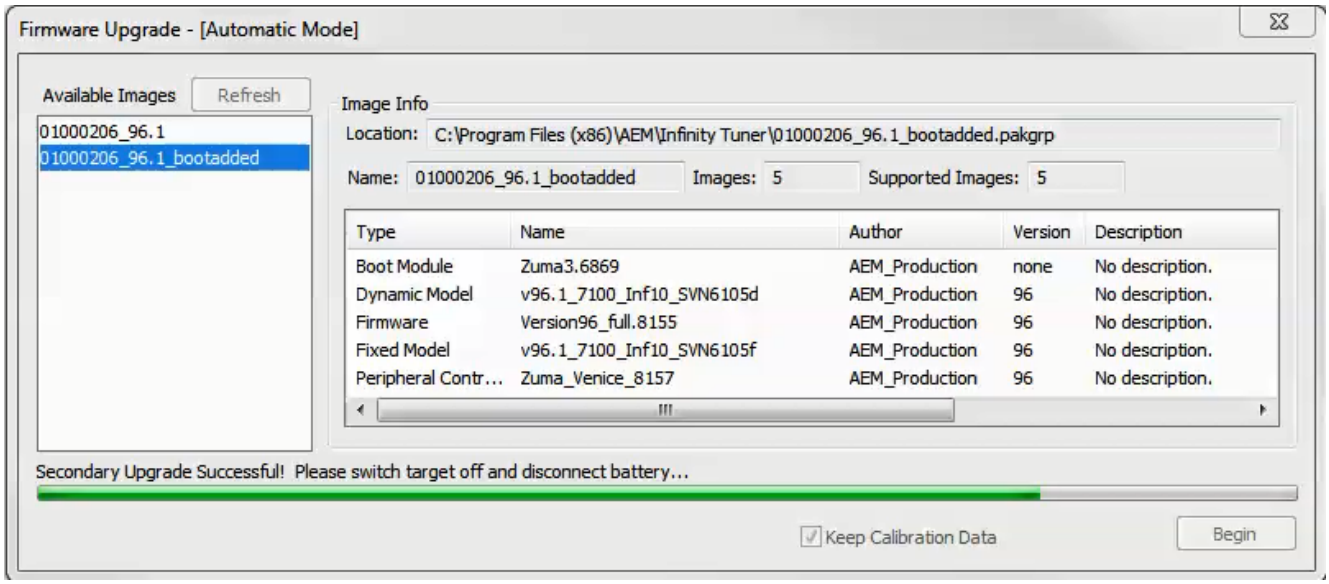
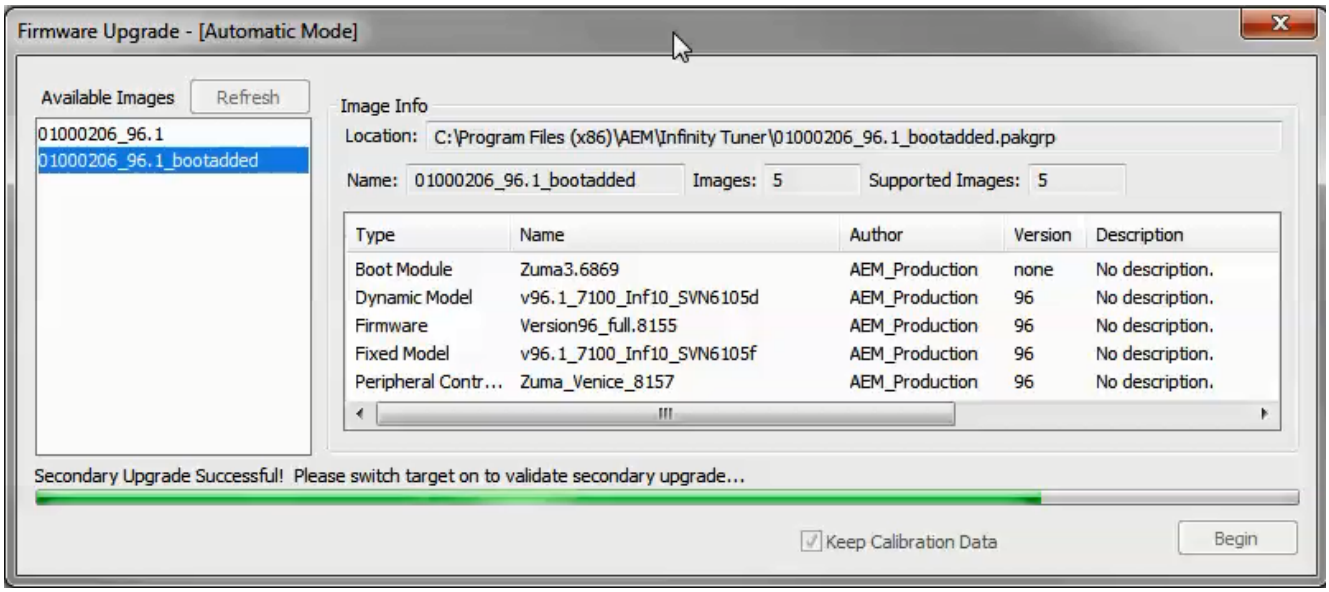


7. When the message below is displayed, turn the ignition switch back on.



8. When the message at the bottom indicates that it's safe to close the window, click "X" button on the top right of the window.

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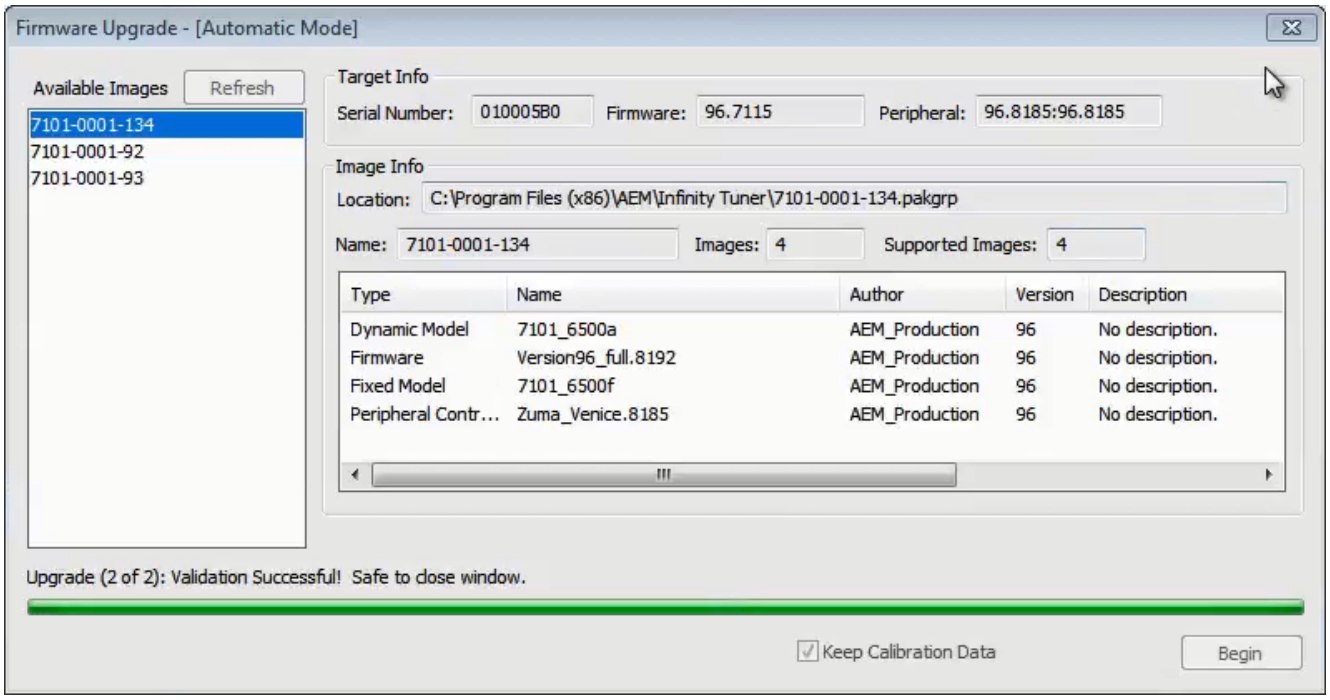

Once the update is complete, it's good practice to cycle the ignition switch to reset the hardware. Once that is done, you can connect and begin monitoring data and/or tuning again. **For applications that use a stepper motor idle valve, it's important that a full power reset be done prior to starting the engine. Turn the key off and wait at least 20 seconds before starting. This will allow the stepper valve to park and reset.**

A firmware update will erase the USB log channel list stored in the ECU memory. This channel list will need to be reset before USB logging will function correctly. Go to Logging>USB Logging – Channel Setup. This dialog allows the user to select channels for USB logging. Manually select channels by left clicking on the check box or alternately by using the arrow keys to scroll through the list and the space bar key to select. Logging lists can be saved for later use by using the Save button. The Load button will load previously saved lists of channels. The Append button will append a different list of channels onto the existing list of selected channels. Note that the list of channels for logging is saved in ECU memory. Channels can't be selected offline. They can only be selected when connected to an ECU.

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