

GAP FLASHER

FOR ALL SUPPORTED VEHICLES

BY

The logo for GAP INNOVATION. The word "GAP" is in a bold, sans-serif font, followed by "INNOVATION" in a similar but slightly lighter font. The text is white and is set against a dark background. There are horizontal lines above and below the text, and a small square icon to the left of the word "GAP".

GAP INNOVATION

QUICK GUIDE, VERSION 1.4
FIRMWARE V1.0

1 Introduction

This quick guide summarizes the operations needed to update the engine map and or GAP Flasher firmware version. Some operations are abbreviated. This guide is not a substitute for the user's manual. Other functions offered by the GAP Flasher are not described in this guide.

1.1 Tunes functionality table

	Tune JukeBox		Individual Tune	
GAP Flasher	Connected*	Not Connected*	Connected*	Not Connected*
Active Knock Protection and warning				
Optional button for tune switching or Anti-Lag				
Tune switching				
Anti-Lag, optional				
Boost/AEM O ₂ on Cluster	Boost or AEM O ₂	Boost	Boost or AEM O ₂	Boost
	Boost and AEM O ₂ **	Boost and AEM O ₂ **	Boost and AEM O ₂ **	Boost and AEM O ₂ **
Optional closed loop fuel control (AEM required)				
Optional Datalogging with data sharing				
Dashboard on Apple or Android devices				
Fault reading / clearing				

	Yes / Optionnal
	With optional instrument cluster update
	Not available

Table 1. Tunes functionality table

*Connected; The GAP Flasher is connected to the vehicle.

Not Connected; The GAP Flasher is not connected to the vehicle or customer did not purchase the GAP Flasher.

**Larger size display. AEM O₂ sensor required.

Specifications are subject to change without prior notice.

**AEM O₂ sensor value is only available when a GAP Flasher is connected to the vehicle.

***Larger size display.

Specifications are subject to change without prior notice.

2 Getting started

2.1 Before first usage

Here is a compendium of operations to be performed before first usage. Each of these operations is described in detail in the referenced section of this manual. This table can serve as a fulfillment check list prior to using the tool.

√	Steps	Operation	Manuel section
	1 st	Installation of the updater software on a computer	<i>section 2.2</i>
	2 ^e	Interface Installation GAP Flasher mobile App	<i>section 2.3</i>
	4 th	Synchronizing the Mobile Application and Registering	<i>section 2.4</i>
	5 th	Updating the GAP Flasher firmware	<i>section 2.5</i>

Table 2. Abstract of operations to complete before first usage

2.2 Installing the Updater Software

Prerequisites

- Having access to a PC type personal computer with Windows XP operating system or higher
- Have access to an internet service

Steps for Installing the updater software

- 1- Download the updater from the following location:
<https://gapinnovation.com/turbodynamics/documents/>
- 2- Once downloaded, click the file and follow instructions on the screen to complete the installation. **For computers running Windows, click the right mouse button and select “run as administrator”.**

Note:

- In order to flash tune using the new website, [section 3](#), the GAP Flasher must have been updated using version 4.9 of the updater software or higher.
- The GAP Flasher must be at build 588 or higher.

2.3 GAP Flasher App installation

Prerequisites

- Own at least one supported mobile device (see user manual).
- Have access to an internet service

Installing the mobile App

Download (free) the GAP Flasher App from Apple App Store or Google Play Store in each mobile device. Before using the App, the files will have to be synchronized with the current GAP Flasher firmware (see [section 2.4](#))

2.4 Synchronizing the Mobile Application and registering

Purpose

Refresh files in the Mobile Application GAP Flasher to achieve consistency with the firmware of the newly updated tool

Note: Performing synchronization immediately after updating the tool or before first usage will prevent prolong file loading when connected to the vehicle due to a poor internet connection.

Prerequisites

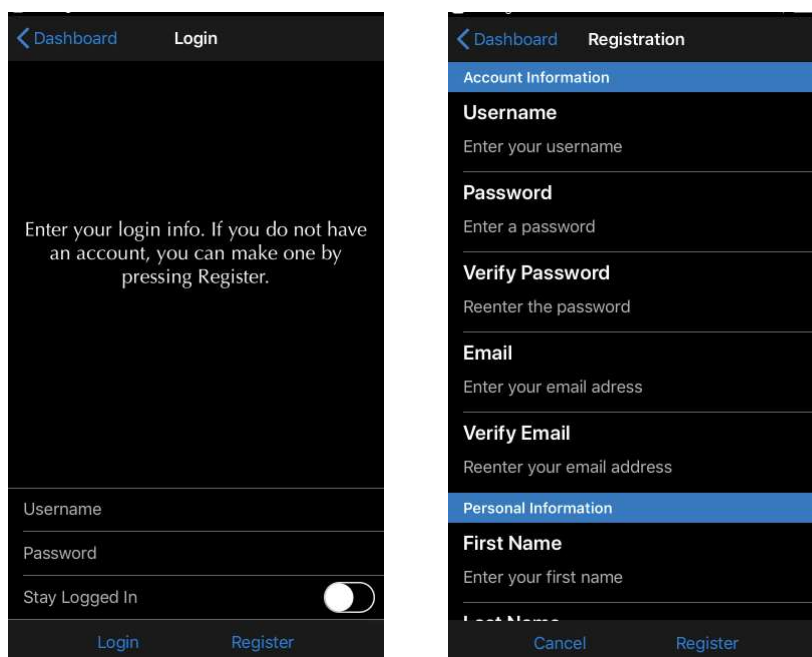
- Having access to a PC personal computer.
- Own a compatible mobile device connected on the internet.
- The GAP Flasher App is installed and up-to-date
- The GAP Flasher firmware was updated or a new mobile device is used with the tool for the first time.

Steps

- 1- Connect the GAP Flasher on the USB port.
- 2- Launch the mobile Application GAP Flasher in the mobile device.
- 3- Click on “ Search for tool”.
- 4- Select the tool in “Bootloader”. For the first synchronization, fill the required fields.

Registering

- 5- Proceed with registering. This can also be done later if needed. Simply fill up the required fields by clicking on Register.



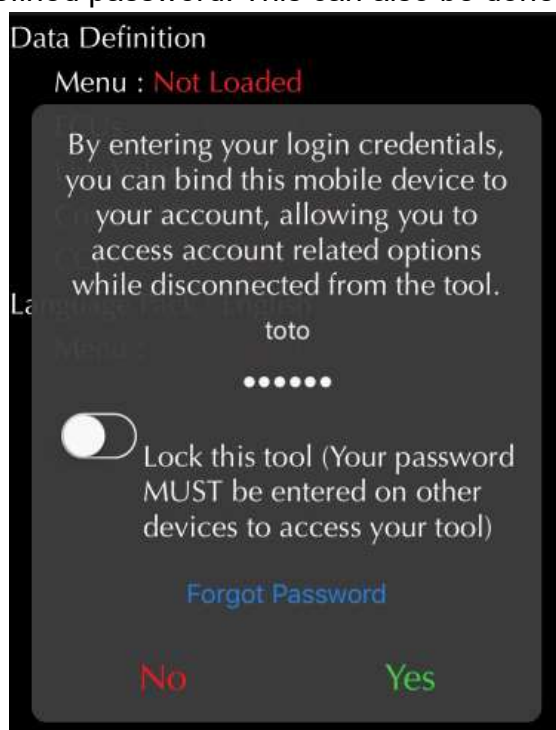
The image displays two screenshots of a mobile application interface. The left screenshot shows the 'Login' screen with a 'Register' button. The right screenshot shows the 'Registration' screen with fields for Username, Password, Verify Password, Email, and Verify Email, followed by a 'Personal Information' section with a 'First Name' field.

Figure 1. Registering

Binding

- 6- Binding the tool will allow usage of certain functions including Online Logs and Sharing when not connected to the tool without the need to log in.

Locking the tool will prevent other users from connecting to the tool using another mobile device unless they enter the defined password. This can also be done later if needed.



The image shows a 'Data Definition' dialog box. It contains a message about binding the mobile device to the account, a password field, a toggle switch for 'Lock this tool', and buttons for 'Forgot Password', 'No', and 'Yes'.

Figure 2. Tool Binding

- 7- Wait while all data files are downloaded : the word “Loaded” indicates completion.
- 8- Exit the application by pressing “Disconnect”.
- 9- Repeat previous steps for each mobile device that may be used with the tool.
- 10- Unplug the tool from the computer.



```

Data Definition
Menu : Loaded
ECUs : Loaded
Live Values : Loaded
Control I/O : Loaded
CCF : Loading...
Language Pack : English
Menu : Not Loaded
  
```

Figure 3. File download or synchronization

2.5 Updating the GAP Flasher firmware

Purpose

Allow the evolution of the GAP Flasher, even after its manufacture.

Principle

Updates are made by reprogramming the firmware.

Benefits of updating the GAP Flasher

- Take advantage of bug fixes (if any)
- Take advantage of operational improvements such as execution speed... and more
- New additions in the tool and application

Prerequisites

- Having access to a PC type personal computer connected to an internet service
- Having completed installation of the updater software ([section 2.2](#))
- Having completed the mobile App installation or update ([section 2.3](#))

2.5.1 Steps for updating the GAP Flasher

- 1- Connect the tool to the USB port of the computer using the supplied USB cable
- 2- Start the updater software previously installed in the computer
- 3- Click on “FIND DEVICE” and wait until pairing of the tool with the updater software is completed. Once paired, the user information, vehicle information and current firmware version of the tool will be displayed.

- 4- Select the desired version of the firmware in the right combo or radio box (if available).
- 5- Click on “PROGRAM FIRMWARE”. The evolution of each data file is observable in succession on the progress bar.
- 6- A subsequent window will appear with “ACTION NEEDED”. The requested operation is synchronization of the mobile App with the tool. Keep the tool connected to the computer to complete this step described in, [section 2.4](#). **Note:** Performing synchronization immediately after updating the tool or before first usage will prevent prolong file loading when connected to the vehicle due to a poor internet connection.

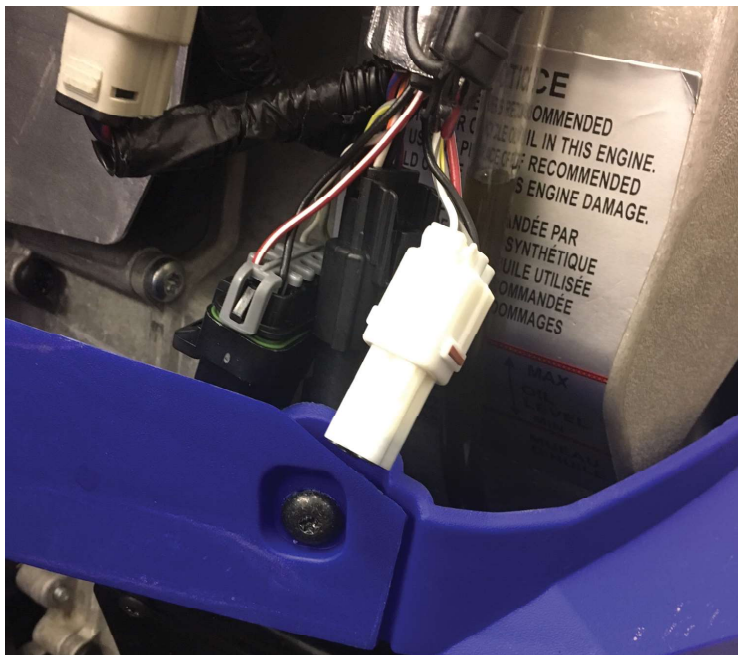


Figure 4. Updater software overview

2.6 General operation of the GAP Flasher

This section explains how to connect the GAP Flasher to the vehicle and commands to navigate through the various interface menus.

2.6.1 Diagnostic port location



Arctic Cat 9000 series and Yamaha Sidewinder: Open the right side panel

The diagnostic port is located behind the chain case. It's the white connector in the photo.

Figure 5. Diagnostic connector

2.6.2 Connecting the GAP Flasher on the vehicle

Once the diagnostic socket is located, it is possible to connect the tool to the vehicle.

Connecting steps

- 1- Remove the cap from the diagnostic connector.
- 2- Turn on the ignition.
- 3- Connect the tool on the vehicles diagnostic port and wait for about 5 seconds.
- 4- Launch the mobile App of the GAP Flasher and navigate as described in the next segment.

2.6.3 Mobile Application, Navigation and Controls

Steps to navigate the Mobile Application

- 1- Proceed with connecting the GAP Flasher
- 2- Lunch the GAP Flasher App
- 3- Click on “Connect” at the bottom of the screen
- 4- Select the desired tool available in the list (“available tools”).

Mobile App representation

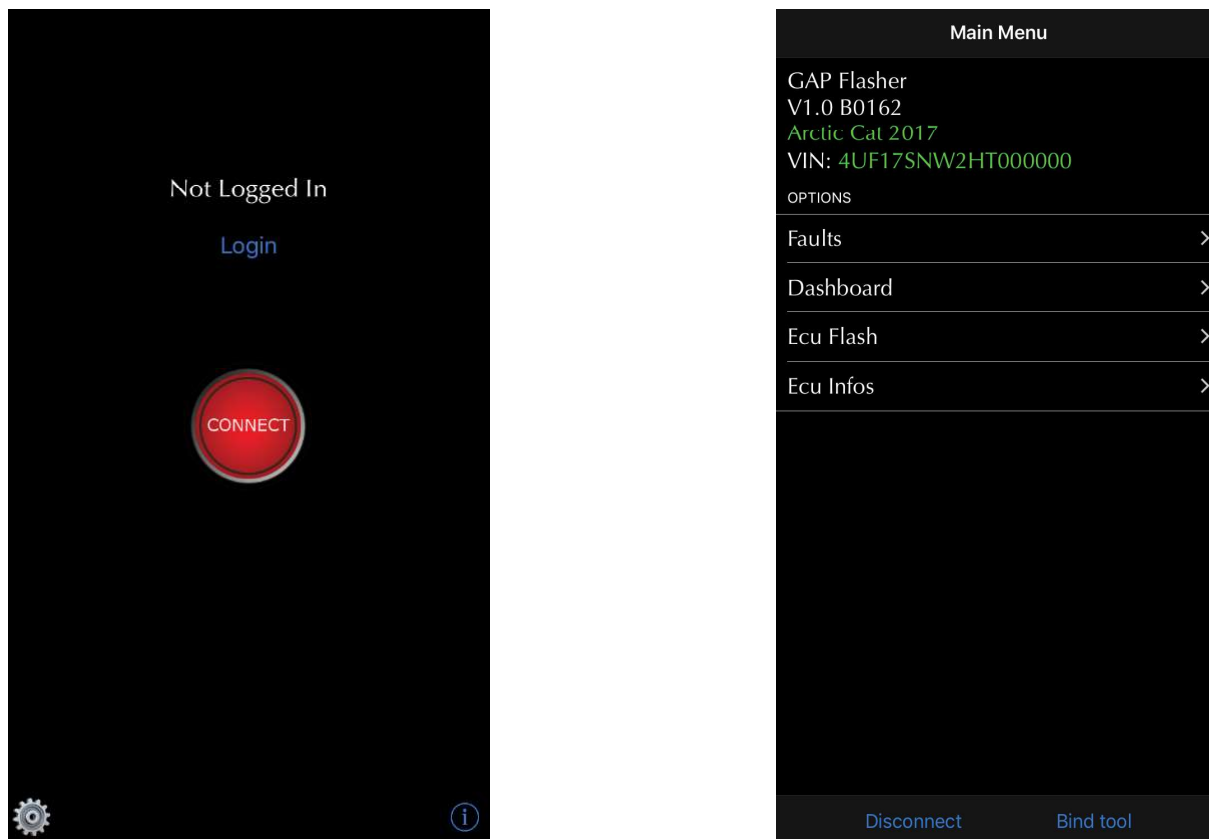


Figure 6. Mobile App representation

Important note: It is not required to add the GAP Flasher to the Device List on the mobile device or to pair it. The Application provides connectivity between the two. Disconnect from any other Bluetooth devices before using GAP Flasher.

3 Steps to update the engine ECU, modified mapping, license system

The following section describes how to purchase and apply modified mapping and cluster flash when using the new platform, license system. This is valid for all purchases made on the tune website hosted under the www.gapinnovation.com/tunes_name_domain.



WARNING

Modified mapping is for use on a race course only! Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher.

As with any diagnostic tool, there is always a risk of failure when re-flashing an ECU. It should only be done when the vehicle is not needed immediately afterwards. Access to the internet is highly recommended in case support is needed. GAP Innovation assumes no liability for damages or injuries incurred during or resulting from the use of the GAP Flasher. Do not do anything to the vehicle or disconnect the flasher until the firmware update is finished. Read the recovery instructions prior to updating an ECU.

When using the Flasher, it is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery. This will ensure that the battery voltage is sufficient. Note: Battery chargers are not suitable due to poor line regulation.



WARNING *An internet connection is required for the whole process.*

Note:

- *In order to flash tune using the new website, the GAP Flasher must have been updated using version 4.9 of the updater software or higher.*
- *The GAP Flasher must be at build 588 or higher.*

Here is a compendium of operations to be performed in order to update ECUs with a modified mapping or other. Each of these operations is described in detail in the referenced section of this manual.

√	Steps	Operations	Manual section
	1 st	Purchase a Tune or Jukebox	<i>section 3.1</i>
	2 ^e	Use the license by filling the form located in the ECU Info function .	<i>section 3.2</i>
	3 rd	Updating the engine ECU	<i>section 3.3</i>
	4 th	Updating the instrument cluster* ECU	<i>section 3.4</i>
Applying Upgrades (single to bundle for example)			<i>section 3.5</i>

Table 3. Steps to update ECUs, modified mapping

*Optional and sold separately from the engine mapping. Required for functions related to the instrument cluster.

3.1 Purchase a tune or Jukebox (bundle)

3.1.1 Introduction and Prerequisites

Tunes are available on the website of your mapping provider. One purchase is required per vehicle (VIN). A purchase will allow updating the ECU with the required file(s) while using the mobile App.

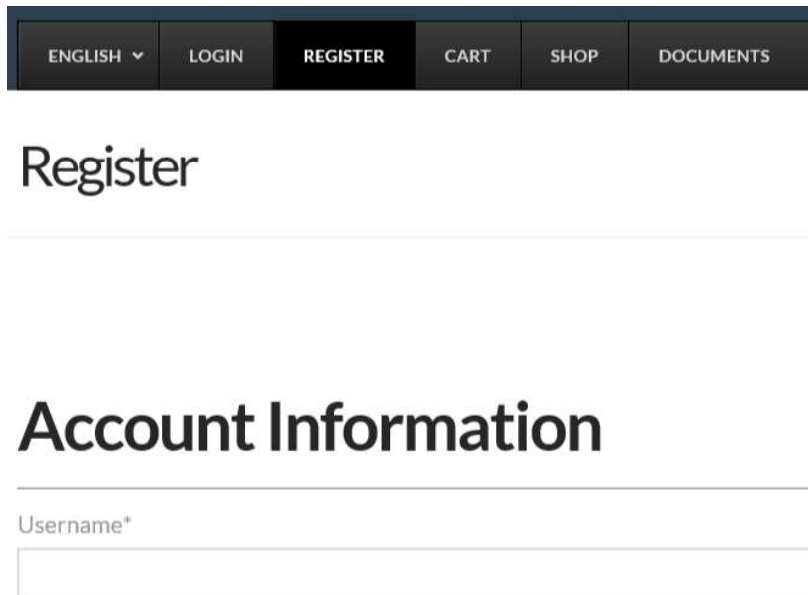
Once on the website offering the tunes, simply log in using the same credentials as those chosen in *section 2.4* and proceed with purchasing. The purchase will automatically be relayed to the GAP Flasher via the user account.

Prerequisites

Already a GAP Flasher owner: Having completed all steps described in *section 2.1*.

Prior to having received your GAP Flasher:

- 1- Go to your Tuner's tune purchasing website <https://gapinnovation.com/turbodynamics/>
- 2- Once on the GAP Innovation platform, click on «Register»
- 3- Fill up the form and click on Submit. **Please, avoid using Hotmail or other free mail services as they are known to cause issues with automated systems.**
- 4- An email with a link to complete the registration will be sent. Check your spam box in case the email would be treated like so.



ENGLISH ▾ LOGIN REGISTER CART SHOP DOCUMENTS

Register

Account Information

Username*

Figure 7. Website registering for purchasing prior to having a GAP Flasher

- 5- Once the GAP Flasher is received, completed all steps found in [section 2.1](#) in order to associate the GAP Flasher with the same account purchases were made on.

3.1.2 Steps, license purchasing

- 1- Go to your Tuner's tune purchasing website <https://gapinnovation.com/turbodynamics/>
- 2- Once on the GAP Innovation platform, click on «Login». Use the same credentials as per [section 2.4](#).
- 3- Purchase the required items in the Shop section.
- 4- Once payment is made, a licence will be automatically created and made available to the GAP Flasher linked to the account. Proceed with [section 3.2](#).

Notes:

- *Add-ons and other options can be purchased and applied later.*
- *Upgrading from an individual tune to a Jukebox (bundle) or other tune upgrades is done without intervention from the tune provider.*
- *Multiple GAP Flashers can be linked to the same account thus licences will be available on each of them.*

3.2 Use the license located in the ECU Info function

3.2.1 Definition and access

This step allows the automated system to choose and apply the correct individual tune, Jukebox or other according to the configuration of the vehicle on which it will be applied (silencer, pressure sensor, etc.).

Purchased Upgrades like Anti-Lag and Datalogger or others like Instrument Cluster (gauge) flash will also be applied to a vehicle in this function.

Access ECU Info

- 1- Perform the initial stages of access ([section 2.6](#))
- 2- Select the “ECU Info” function
- 3- User will be asked to put a comment which will be accessible to the tune provider if needed.
- 3- Wait until the GAP Flasher finishes with interrogating the ECU
- 4- The resulting list will be displayed and can be sent by e-mail.

Access the License list

Once the ECU information access steps have been completed, simply press the Licenses button located at the bottom.

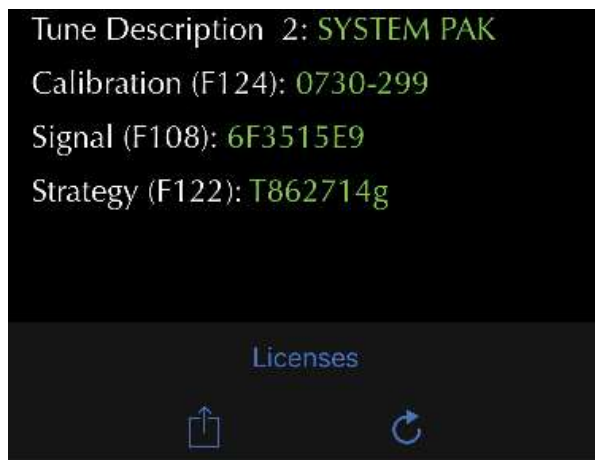


Figure 8. License button

3.2.2 Editing a license, steps



WARNING

Improper selection of vehicle parameters may reduce performance, can render the vehicle unusable or pose a risk. It is the user responsibility to set parameters properly.

Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher or a tune.

- 1- Select a license and click on the *Editing* or *Use this license* button.

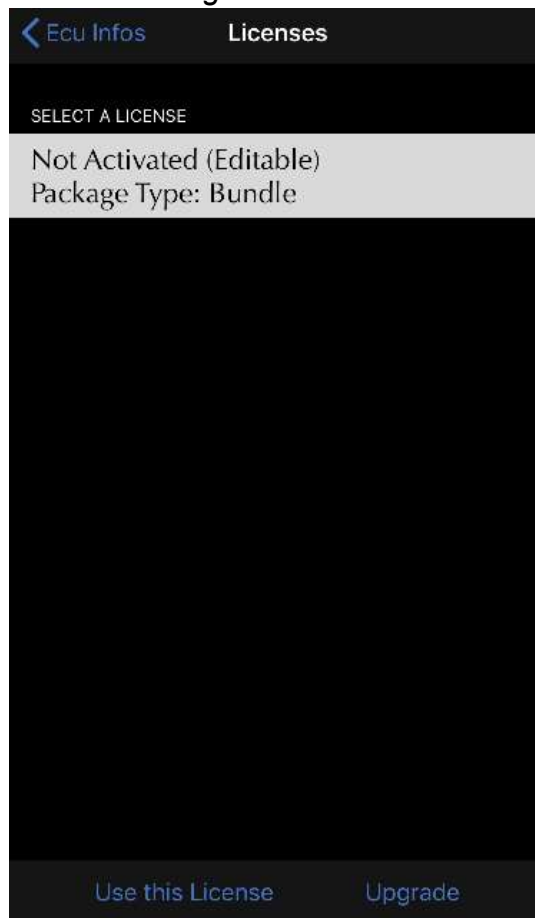


Figure 9. Editing a License

2- Adding purchased Add-Ons

If Add-Ons were purchased (Anti-Lag, Datalogger...), the first screen will allow adding them to the license. Anti-Lag and Datalogger in the following example can be added. If no Add-Ons were purchased, the App will not show this screen and go to step 4, *Setting Vehicle Parameters*.

Layout

The name and how many items were purchased are indicated. Two (2) Anti-Lag and two (2) Datalogger in this example. To continue without adding an Add-On, click on the *Skip* button.

Adding

Click on an item, Anti-Lag in this example, to add it to the license. Click on the *To Add* button to go to the next step, *Setting Vehicle Parameters*.

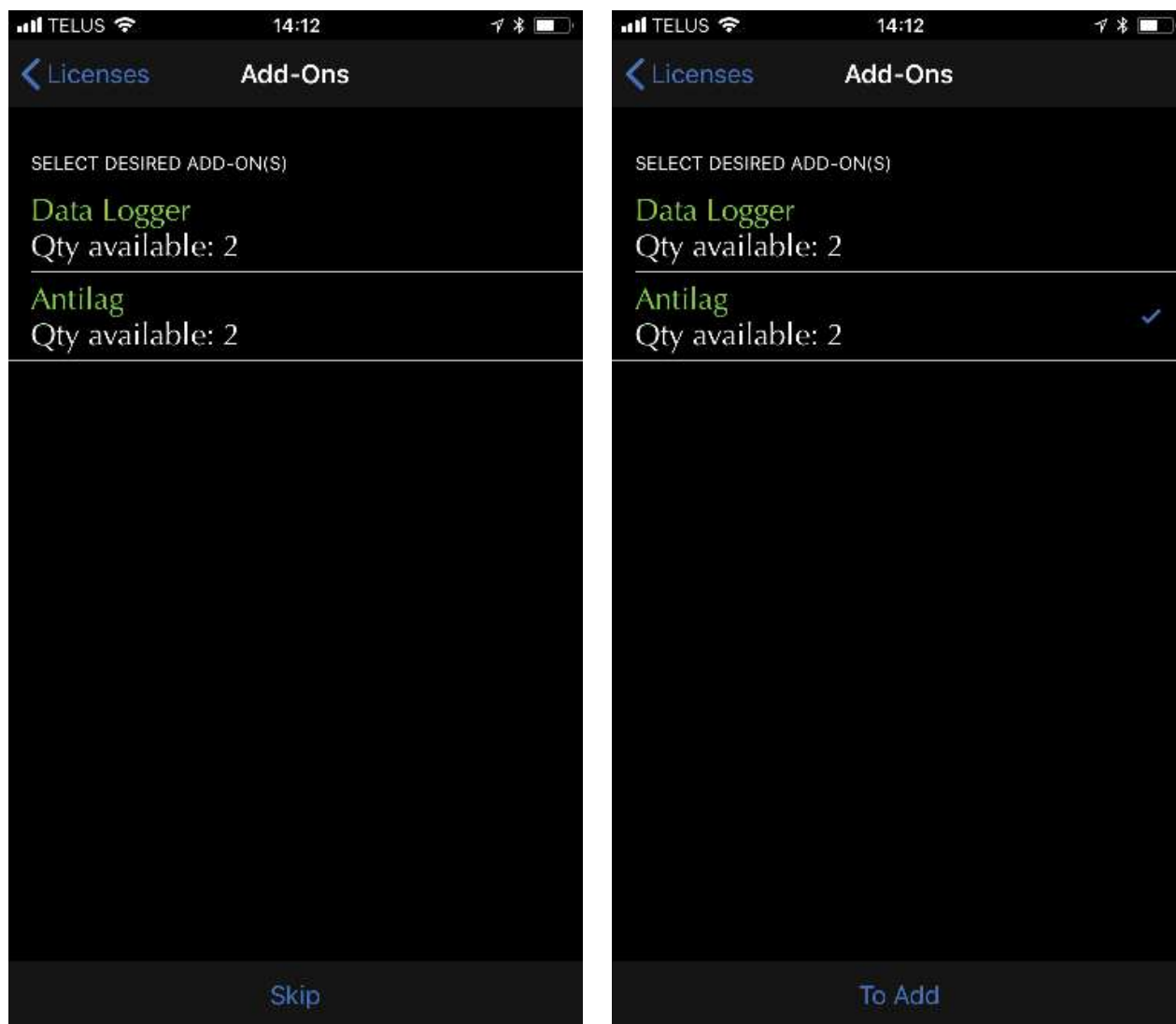


Figure 10. Licenses Add-Ons

3- Setting Vehicle Parameters

Fill the various fields which will allow the automated system to select the tunes suited for these specific vehicle parameters. Once completed, the *Activate* button will appear. Review your selections and click on *Activate*.

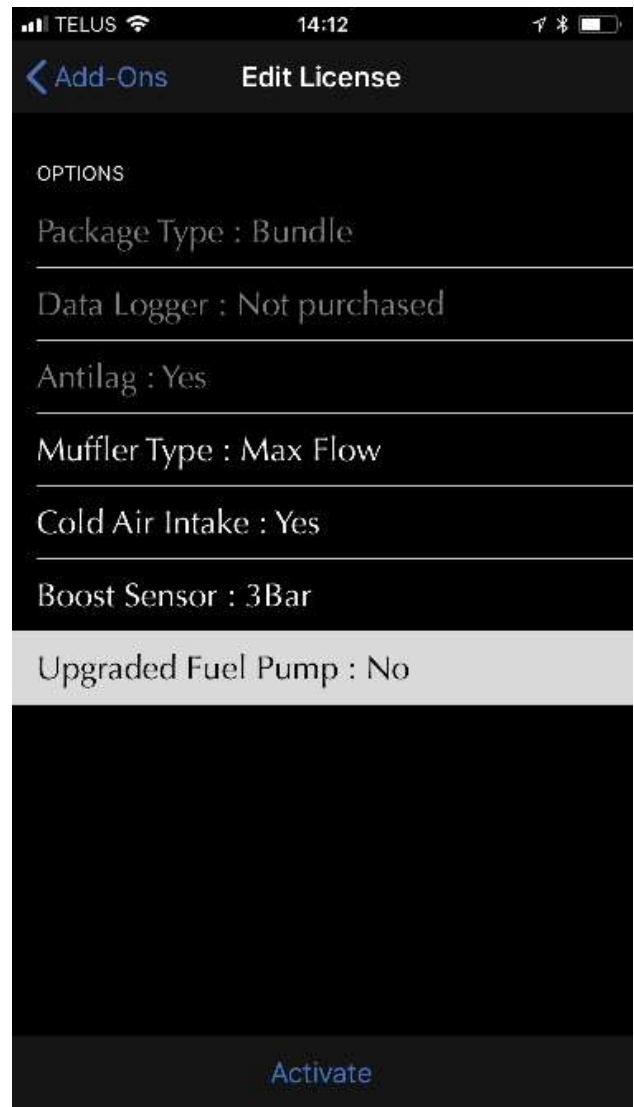
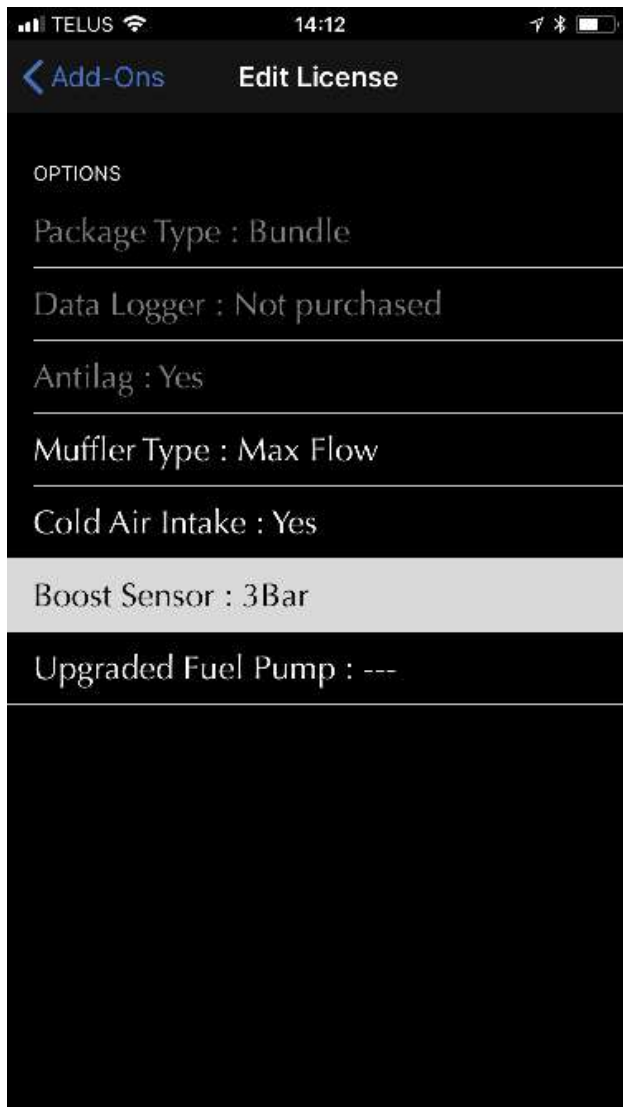


Figure 11. Licenses Vehicle Parameters

Result will be shown, click on *Generate License* to continue.

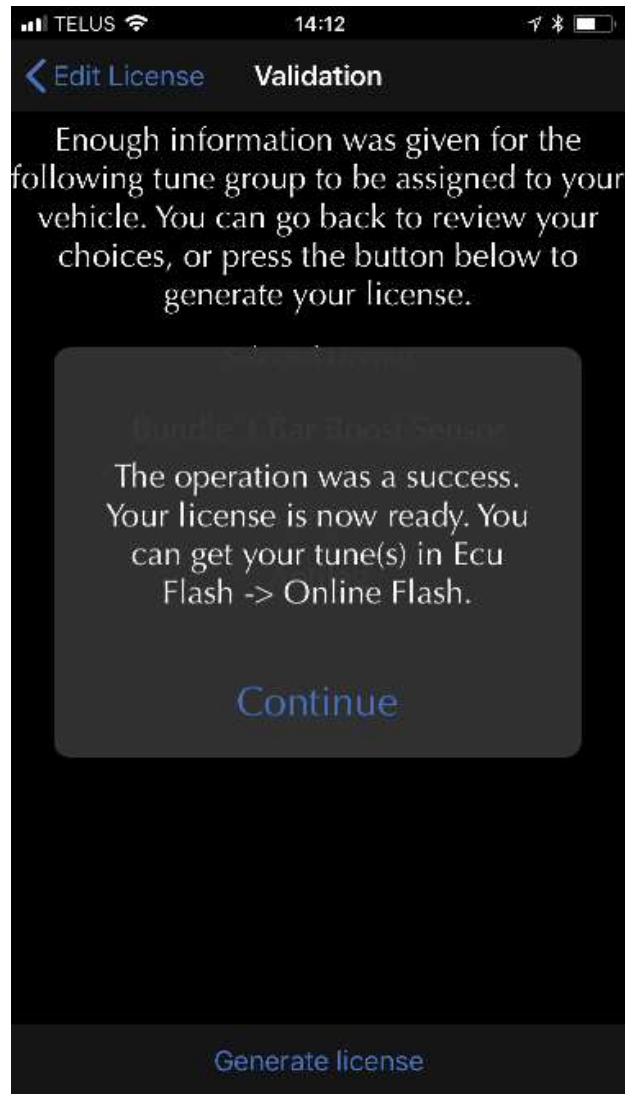
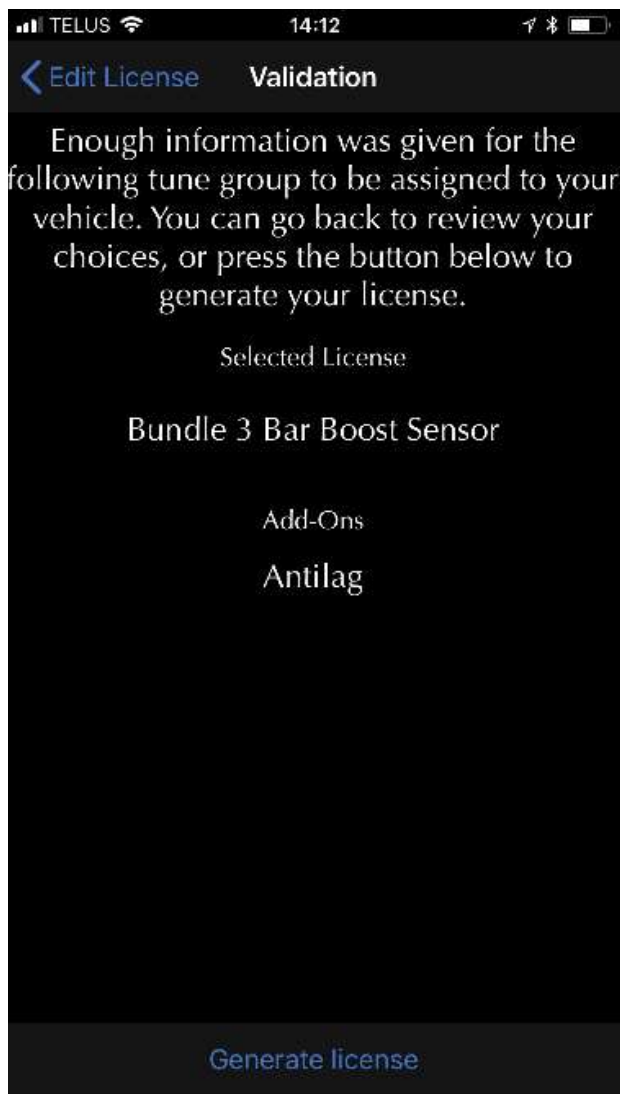


Figure 12. Generate the license

Notes:

- Some settings will rapidly give a result. For example, when Stock Muffler is selected, no other field requires filling since there's only one tune jukebox or individual tune group for this configuration.
- Vehicle parameters can be changed later if needed. For example, if one would be to purchase an upgraded fuel pump, the process would simply be repeated but this time, the upgraded fuel pump option would be set to Yes. The tune provider does not need to be contacted to proceed with License changes. Changing vehicle parameters is free of charge.
- Licences are associated with an ECU. For example, there will be two licences made available when a tune and instrument pack update were purchased.

Anti-Lag particularities

The AntiLag purchase comes with an instrument cluster “High Beam Transfer” licence. This is used for transferring the high beam switch signal to the flasher instead of using a wiring harness. This needs to be applied when using the high beam switch to activate Anti-Lag. This is also included in the Instrument Cluster Update “Cluster Full Feature” which shows live data. In which case, the instrument “High Beam Transfer” licence does not need to be applied since included in the “Cluster Full Feature” licence.

For example

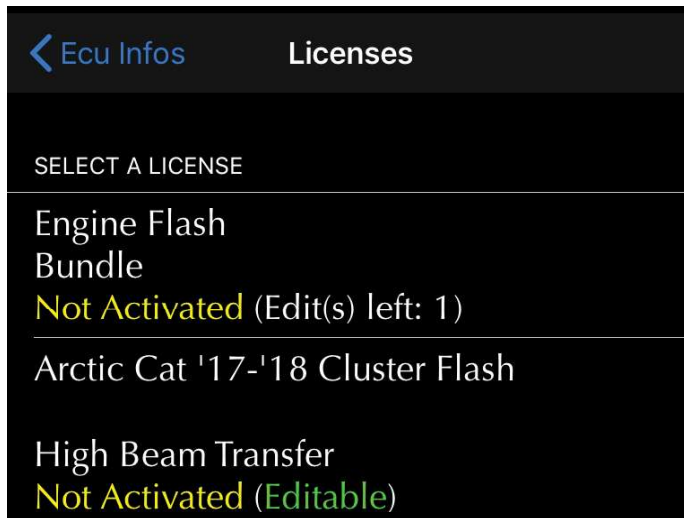


Figure 13. Anti-Lag licence example 1, High Beam Transfer

An Engine Tune and Anti-Lag were purchased. Both licence (**Bundle--Add On**) will have to be used in order for the Anti-Lag to work and Anti-Lag activation using the high beam switch (**High Beam Transfer**)

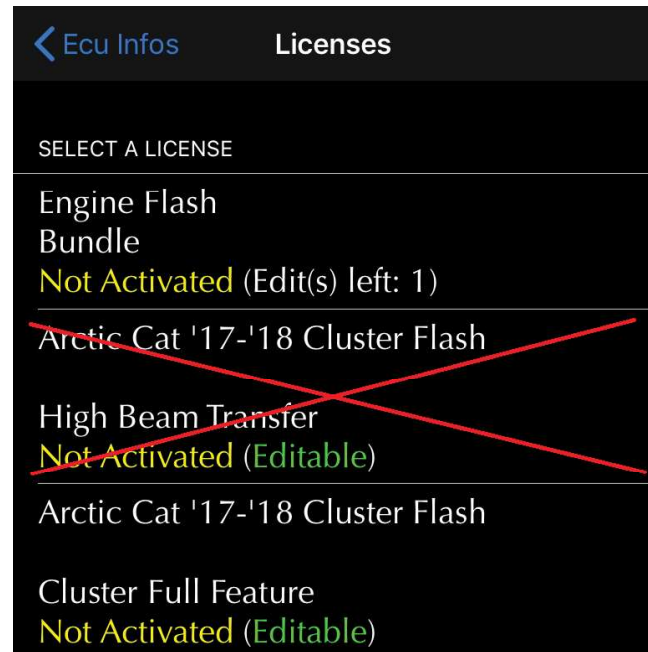


Figure 14. Anti-Lag licence example 2, Cluster Full Feature

An Engine Tune, Anti-Lag and Instrument Cluster (Gauge) update were purchased. The engine (**Bundle--Add On**) and Instrument Cluster Update (**Cluster Full Feature**) licences shall be applied. **The Anti-Lag activation using the high beam switch is already included in the Cluster Full Feature thus not used.**

3.3 Updating the engine ECU

Steps

- 1- Perform the initial stages of access ([section 2.6](#))
- 2- Select the “ECU Flash” function
- 3- Select “Online ECU Flash”

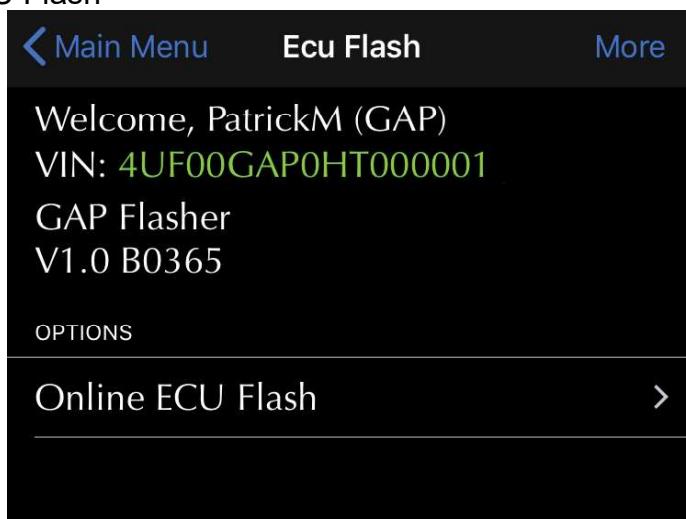


Figure 15. ECU Flash

- 4- Select the JukeBox or individual tune to be flashed
- 5- Turn ignition off, disconnect the tool from the vehicle and start the engine.

Notes:

- *When a bundle of tune is purchased, updating the engine ECU with the file containing the name **Jukebox** or **JB** shall be performed. The single tunes without the Jukebox word in them shall only be used for specific cases. For example, racing tunes which are not part of a Jukebox.*
- *An internet connection is required for using **Online ECU Flash**.*

3.4 Updating the instrument cluster ECU

Steps

- 1- Perform the initial stages of access ([section 2.6](#))
- 2- Select the “ECU Flash” function
- 3- Select “Online ECU Flash”
- 4- Select the instrument cluster file to be applied.
- 5- Turn ignition off, disconnect the tool from the vehicle and start the engine.

Note: *Both the engine and instrument cluster ECUs shall be updated in order to benefit from all functionalities.*

3.5 Upgrades

When an upgrade from a single tune to a Jukebox (or other) is purchased, it will be applied in this sub section.

Repeat the *Access the License list* steps and click on *Upgrades* instead of *Edit the licence*.

For example:

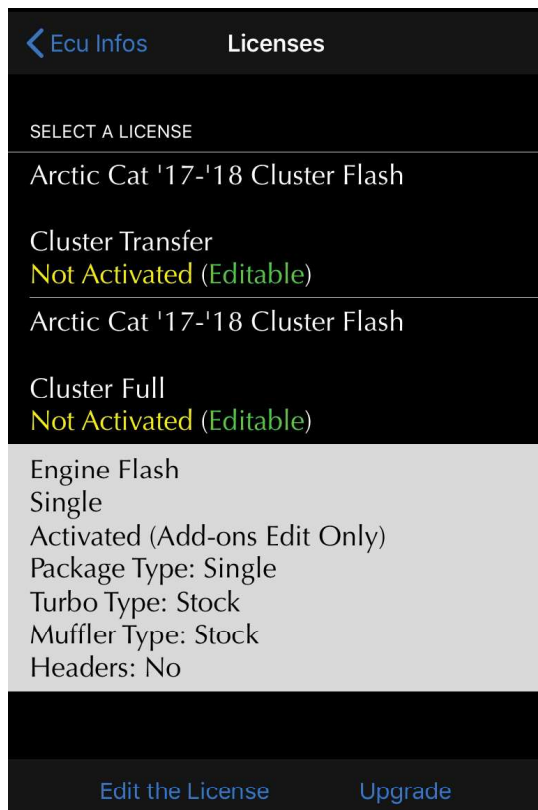


Figure 16. Upgrade example view # 1

Select the licence and click on Upgrade.

Proceed with updating the ECU as per the previous page.

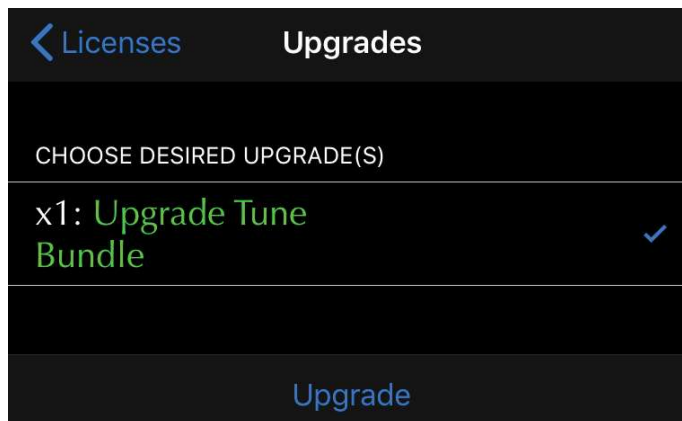
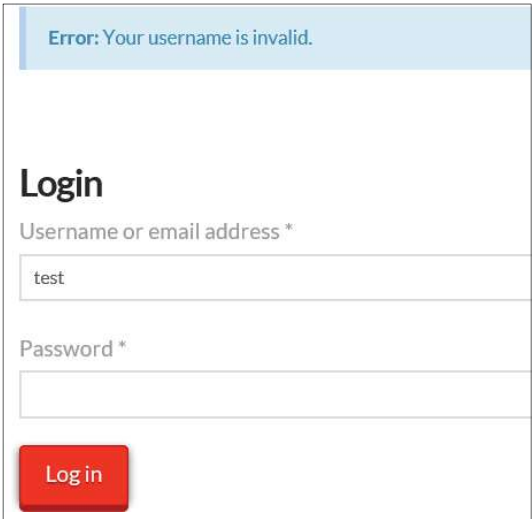
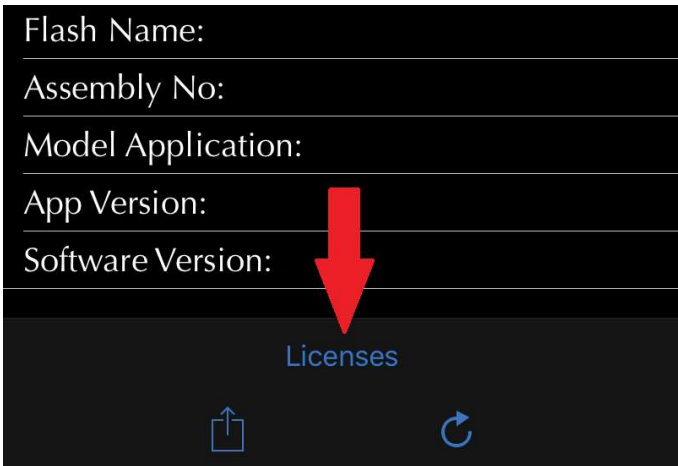

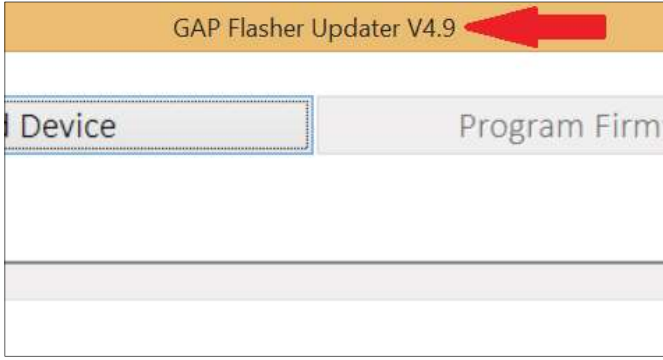
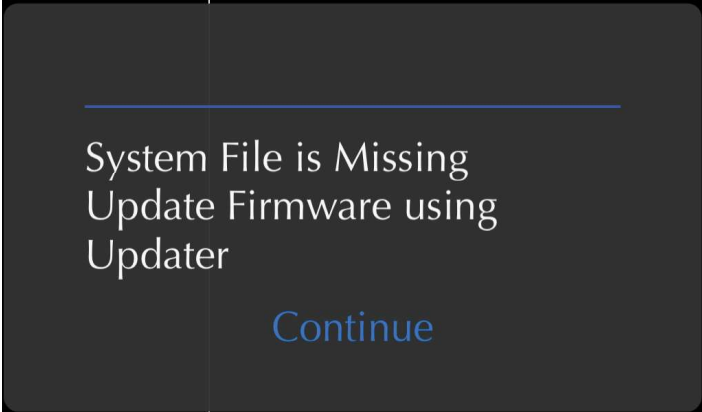
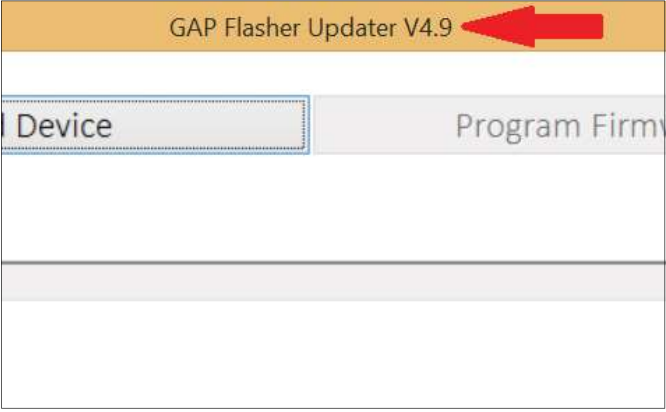


Figure 17. Upgrade example view # 2

Choose the upgrade and apply it by clicking on Upgrade.

3.6 Troubleshooting flashing process

Symptom	Solution
<p>Cannot log in.</p> 	<p>Make sure to have registered the GAP Flasher as per section 2.3</p>
<p>Licence button not visible in ECU Info, Outdated App.</p> 	<p>Update the mobile App found on the Apple Store or Google Play Store.</p>
<p>Outdated firmware message when trying to flash the ECU in ECU Flash--Online Flash</p> 	<p>Make sure you are using updater V4.9. If not, uninstall and install the updater software on the computer. Update the tool firmware to build 588 or higher using the updater software (program firmware button), section 2.5</p> 

Symptom	Solution
<p>System File is Missing message during the reflash process</p> 	<p>Make sure you are using updater V4.9. If not, uninstall and install the updater software on the computer. Then, proceed with updating the GAP Flasher (program firmware or program flash file button), section 2.5</p> 

4 Steps to update ECUs, modified mapping, Old system

The following section describes how to apply modified mapping and cluster flash when using the old platform. This is valid for all purchases **not** made on the tune website hosted under the www.gapinnovation.com/tunes_name_domain.



WARNING

Modified mapping is for use on a race course only! Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher.

As with any diagnostic tool, there is always a risk of failure when re-flashing an ECU. It should only be done when the vehicle is not needed immediately afterwards. Access to the internet is highly recommended in case support is needed. GAP Innovation assumes no liability for damages or injuries incurred during or resulting from usage of the GAP Flasher. Do not do anything to the vehicle or disconnect the flasher until the firmware update is finished. Read the recovery instructions prior to updating an ECU.

When using the Flasher, it is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery. This will ensure that the battery voltage is sufficient.

Note: Battery chargers are not suitable due to poor line regulation.

Here is a compendium of operations to be performed in order to update the ECU with a modified mapping. Each of these operations is described in detail in the referenced section of this manual.

√	Steps	Operations	Manual section
	1 st	Provide the required information to the modified mapping provider.	section 4.1
	2 ^e	Update the GAP Flasher and mobile App synchronization.	section 4.2
	3 rd	Updating the engine and/or Cluster ECU	section 4.3

Table 4. Steps to update the engine ECU, modified mapping

4.1 Provide information to the mapping provider

In order to build a customized file, the supplier will need to know the current version of the ECU engine as well as the Vehicle Identification Number (VIN). Depending on the initial contact, retrieve the information (ECU Info function) and send it to the provider.

Access and sending ECU Info

- 1- Perform the initial stages of access ([section 2.6](#))
- 2- Select the “ECU Info” function
- 3- User will be asked to put a comment which will be accessible to the tune provider if needed.
- 3- Wait until the GAP Flasher finishes with interrogating the ECU
- 4- The resulting list will be displayed and can be sent by e-mail.

4.2 Updating the GAP Flasher with the modified file

Once the provider confirms that a file is ready, proceed as follows:

- 1- Connect the tool to the USB port of the computer using the USB cable
- 2- Start the updater software previously installed on the computer ([section 2.2](#)).
- 3- Click on “FIND DEVICE” and wait for pairing of the tool with the updater software. Once paired, the user information, vehicle information and current firmware version of the tool will be displayed.
- 4- Click on “PROGRAM FLASH FILES ONLY”. The evolution of each data file is observable in succession on the progress bar.
- 5 A subsequent window will appear with “ACTION NEEDED”. The requested operation is synchronization of the mobile App with the tool. Keep the tool connected to the computer to complete this step described in [section 2.5](#). **Note:** Performing synchronization immediately after updating the tool or before first usage will prevent prolong file loading when connected to the vehicle due to a poor internet connection.



Figure 18. Updater software overview

4.3 Updating the engine and/or Cluster ECU

Steps

- 1- Perform the initial stages of access ([section 2.6](#))
- 2- Select the “ECU Flash” function

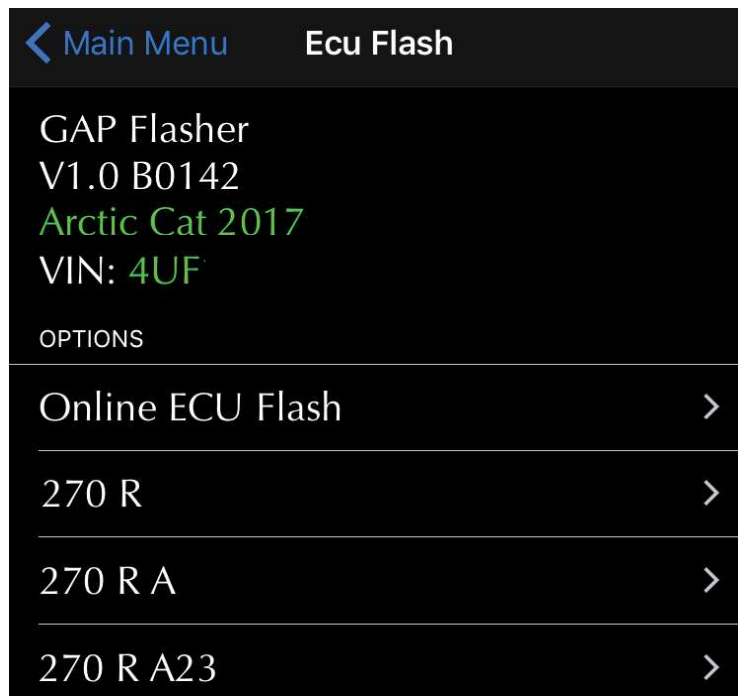


Figure 19. ECU flash

- 3- Select the JukeBox or individual tune to be flashed
- 4- Repeat if a Cluster flash was purchased
- 5- Turn ignition off, disconnect the tool from the vehicle and start the engine.

Notes:

- *When a bundle of tune is purchased, updating the engine ECU with the file containing the name **Jukebox** or **JB** shall be performed. The single tunes without the Jukebox word in them shall only be used for specific cases. For example, racing tunes which are not part of a Jukebox.*