

GAP FLASHER

FOR ALL SUPPORTED VEHICLES

BY

GAP INNOVATION

USER MANUAL, VERSION 1.2
FIRMWARE V1.0

**WARNING**

For your safety and that of others, please read this manual before using the GAP Flasher. Failure to follow instructions could result in serious consequences.

**WARNING**

The GAP Flasher is a device that allows updating the engine ECU firmware and provide the necessary information to the re-map provider.

Read this instruction manual carefully!

Disclaimers

Neither the distributors nor the manufacturer (GAP Innovation, Inc.) accept any responsibility or liability for damages incurred through use of the GAP Flasher. This includes all damages to the vehicle itself, vehicle systems or property. This also includes injuries to the user or other persons. The warranty is limited to the functionality of the GAP Flasher itself (for further warranty details, please consult the last page of this document). This includes especially:

- Damages incurred through improper use of the GAP Flasher
- Damages incurred through the use of the GAP Flasher to change vehicle configuration and / or settings, update the engine ECU, etc.
- Damages incurred through clearing faults without effecting proper repairs
- Damages incurred through usage of any third party products delivered by the GAP Flasher (remap etc).

**WARNING**

The GAP Flasher is not designed to be left in place for long periods. Please unplug after use!

Terms and conditions

Do not copy or reverse engineer. When purchasing our products, downloading our App, using our products or App, you agree not to reverse engineer, copy, extract data or any other manipulation other than the intended usage.

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Specifications are subject to change without prior notice.

Suggestions

For convenience and even security purposes, it is suggested that the user keeps an updated version of this manual in PDF format on his or her mobile devices. Thus, accessibility to procedures will be possible anywhere and anytime. By the same token, the computerized version facilitate searching for a particular topic.

You can proceed to download the User's Manual on the manufacturer's website.

The manual is updated regularly.

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1 Introduction

1.1 Objectives of the GAP Flasher

The GAP Flasher has been designed to achieve objectives that meet the demands of vehicle owners.

- Read and transmit information required to modify the engine mapping by the supplier.
- Update ECUs with the custom version provided by a vendor or the original mapping.
- Reading and erasing fault codes.
- Live data viewing and recording (recording optional)
- Control or engine parameters (Anti-Lag...)

1.2 Connecting the GAP Flasher

1.2.1 Connectors descriptions



Figure 1. Micro USB socket for USB cable used to connect the GAP Flasher to a computer.



Figure 2. OBDII connector which connects the GAP Flasher to the supplied wiring harness

1.2.2 Diagnostic port location



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

The diagnostic port is located behind the chain case.

Figure 3. Diagnostic connector, 998cc Turbo Snowmobiles

1.2.3 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- Refer to the user guide for App connection steps



Figure 4. Wiring harness to connect on the diagnostic port of the vehicle.



WARNING

Prior to GAP Flasher firmware build 245, it was not designed to be left in place for long periods. Please unplug after use!

Leaving the GAP Flasher connected for long periods without the engine running will drain the vehicle's battery.

Note: From GAP Flasher firmware build 245, the tool can be permanently left connected without risk to the battery. It is recommended to disconnect the tool during the off season.

1.2.4 Disconnecting the GAP Flasher

The GAP Flasher can be disconnected at any time except:



WARNING

Do not disconnect GAP Flasher during an ECU flash as a breakdown or serious consequences could arise (descriptions of these functions and recovery methods are found in the user manual).

1.3 Brief description of offered Functions

The functions offered by the GAP Flasher are categorized in the following table.

Dashboard	Features	Faults	ECU Info
Viewing engine live data. Optional data-logger with export capabilities*.	Allows controlling engine parameters, Anti-Lag for example**	Read and clear fault codes	Reading the current version of the firmwares as well as the serial number of the computers (ECUs)
ECU Flash			
Original software version or modified mapping**			

Table 1. Functions offered

**Optional and sold by the GAP Flasher resellers.*

***Sold separately and transported by the GAP Flasher*

Note : Some functions can help achieve more than one goal; this is particularly the case for the “Fault” function and “ECU Flash” after a repair.

1.4 Supported vehicles

Covered vehicles are those for which the GAP Flasher tool can be used.

1.4.1 Model Year Identification

The Model Year is an approximate description of the production time of a vehicle in terms of its specifications or design revisions.

Note : The Model Year does not coincide systematically with the calendar year at which the vehicle was manufactured.

You can confirm the model year of a vehicle by checking the 10th character of the Vehicle Identification Number (VIN). It is located on the chassis and analyzed as follows:

10th Character of the VIN	Model Year	
	Years interval	Signification
Numbers, 1 to 9	2001-2009	"1" for 2001 ... 9 for 2009
Letters	2010 and up	"A" for 2010 "B" for 2011 ...

Table 2. Determining a vehicle Model Year using the VIN

4th and 5th VIN character	Model Year
4UF17SNW6HT000000	2017
4UF17SNW6JT000000	2018

Table 3. Model year as per the VIN example

* The letters "I", "O" and "Q" are omitted.

1.4.2 Supported vehicles list

- Yamaha Sidewinder 2017 and up snowmobiles
- Arctic Cat 9000 series including Thundercat 2017 and up snowmobiles
- Bombardier (BRP) snowmobiles fitted with the 900cc Turbo, 2019-2021, BRP Expedition 900 Turbo 2022.

1.5 Interface

An interface is a connecting device which allows exchanges and interactions between the tool and the user.

1.5.1 Mobile App

The application developed for mobile devices (see below for compatibility) can be downloaded free of charge from the Apple App Store or Google Play Store under the name GAP Flasher (installation instructions are detailed in [section 2.3](#)).

1.5.2 Compatible mobile devices

The GAP Flasher is compatible with the following devices :

Apple mobile devices*	Android mobile devices
iPad 3rd gen onwards	Fitted with a Bluetooth V4.0 and up transceiver and running on OS 5.0 onwards**
iPad Mini	
iPod Touch 5 onwards	
iPhone 4S, 5, 6 onwards	

Table 4. Compatible mobile devices

*iOS 8 and up. Using the latest release (non Beta) version of iOS is strongly recommended.

**Despite compliance with these requirements, compatibility cannot be guaranteed because of the large variety of Android devices on the market. For example, a user has reported a device manufactured by Doogee cannot be used with the tool.

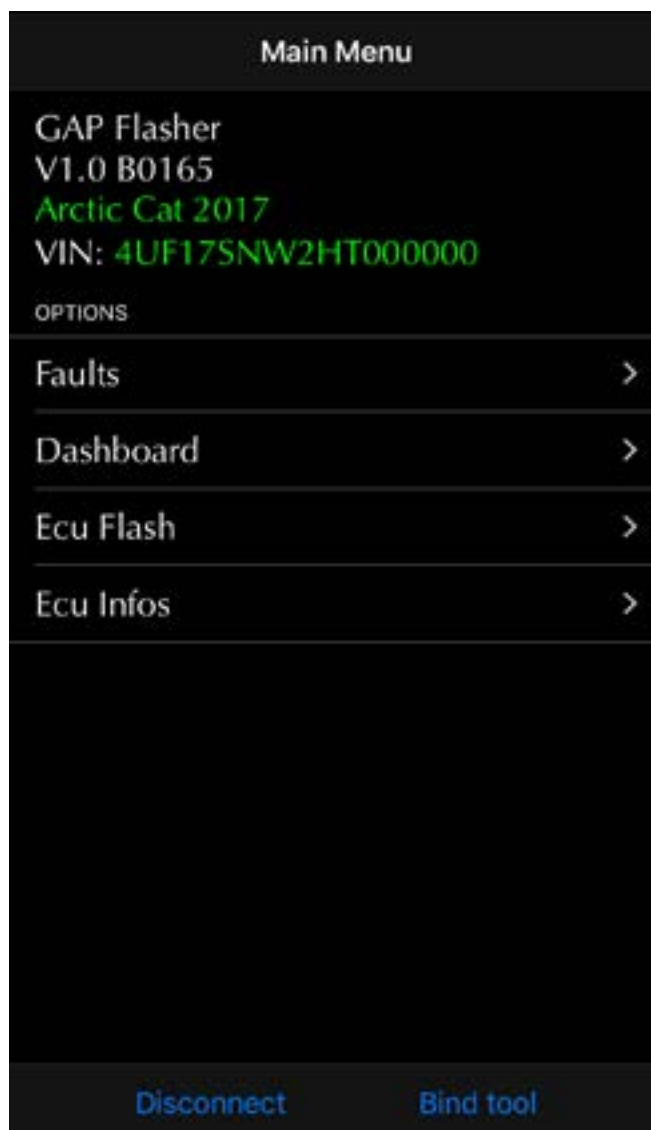


Figure 5. Menu overview

1.6 Usage and transferring the GAP Flasher (new owner)

1.6.1 Usage and limitations

The GAP Flashers are branded and sold by vendors thus can only house their own tunes. One can, however, have and flash tunes for different sleds within the same flasher.

The flasher is not tied to the vehicle itself thus it can flash any vehicle for which a tune was purchased and uploaded to the associated GAP Flasher account or when using the automated purchasing system. The tunes, datalogger and Antilag are, of course, locked to a specific vehicle. A GAP Flasher can contain multiple maps with anti-lag and data logging.

1.6.2 Purchasing a second-hand GAP Flasher

In the event of a GAP Flasher being sold second hand, the new owner will simply have to purchase a Tune from the same vendor for his vehicle.

1.6.3 Selling a vehicle

In the event of a tuned sled being sold without the GAP Flasher, the new sled owner can purchase a flasher from the same vendor who previously provided the tune for this vehicle and gain back all functions that are ECU related. For example, Jukebox and Anti-Lag. It will be up to the tuner to decide if the datalogger will be transferred or needs purchasing.

1.6.4 Transferring

Transferring tune product can be done at a fee determined by the tune provider. The old sled will have to be returned to stock in order for the new one to have tune transferred. Contact your tune provider for more details.

1.7 Tunes functionality table

GAP Flasher	Tune JukeBox		Individual Tune	
	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 Boost Timer				
Optional Datalogging with data sharing				
Dashboard on Apple or Android devices				
Fault reading / clearing				



Yes / Optionnal

With optional instrument cluster update

Not available

Table 5. Tune functionality table

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

Not Connected; The GAP Flasher is not connected to the vehicle.

Not Used; Same as not connected, for users who have not purchased a GAP Flasher.

**AEM O₂ sensor (sold separately) value at hour meter location is only available when a GAP Flasher is connected to the vehicle for 2017 to 2019 tunes. GAP Flasher not mandatory for 2020 (october 2019+) and up tunes.

***For larger size display; Cluster flash V2 (released october 2019) and up required for AFR, V1 and up for Boost.

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	Manual 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>
	3 rd	Updating the GAP Flasher firmware	<i>section 2.4</i>
	4 th	Synchronizing the Mobile Application and Registering*	<i>section 2.5</i>
	4 th	GAP Flasher and accessories installa- tion on the vehicle	<i>Refer to the installation guide</i>

Table 6. Abstract of operations to complete before first usage

*This step is mandatory for the purchase and to obtain a modified engine map.

2.2 Installing the Updater Software

Purpose

Take full advantage of the GAP Flasher tool with updates.

Principle

Install the free software specifically dedicated to updating the tool, called «“Tuner name here” Updater» on a PC.

Note : *Installation of the updater software is required only once. If it turns out that an update is required, a message will pop up when launched with directions to follow.*

Prerequisites

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

Note : *It is required to use an administrator account to be able to install and use the software on Windows 10.*

Steps for Installing the updater software

- 1- Download the updater from the location as per the Quick Guide

https://gapinnovation.com/...tuner_name.../documents/

GAP Flasher PC updater software. Logiciel de mise à jour du GAP Flasher

- 2- Once downloaded, click on the file and follow instructions on screen to complete the installation.
For computers running Windows, click the right mouse button and select “run as administrator”.

2.3 GAP Flasher App installation

Purpose

Be able to interact with the GAP Flasher and control it.

Prerequisites

- Own at least one supported mobile device (see [section 1.5.2](#)).
- Have access to an internet service

Installing the mobile App

Download (free) the GAP Flasher App from the 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 2.5](#))

Note : Occasional updates are recommended. They will be announced by the Applications Manager. Please proceed with updating the GAP Flasher to the latest firmware when updating the mobile App [section 2.4](#).

2.4 Updating the GAP Flasher firmware

Purpose

Allowing 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](#))

2.4.1 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". to update the GAP Flasher firmware.
-Click on "PROGRAM FLASH FILES" to update the GAP Flasher with new or updated tune files.
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, [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.

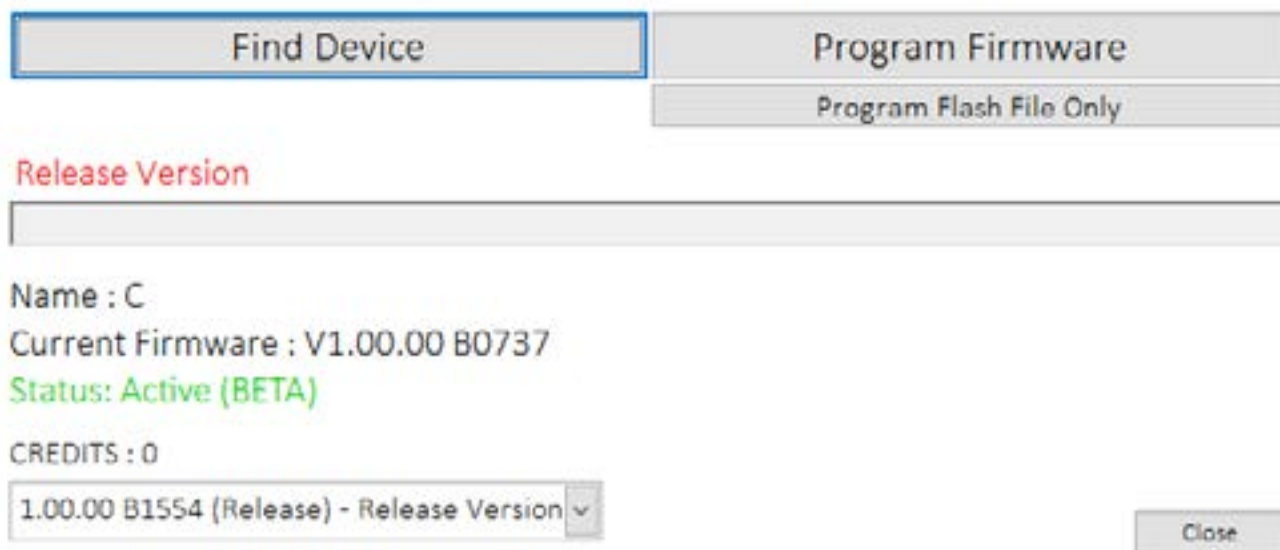


Figure 6. Updater software overview

Troubleshooting, updater software

Occasionally, some obstacles can arise when using the updater software. Here are tips to get around them.

Problems	Solutions
The updater software is not working properly or cannot connect to the internet.	Change software permission in Firewall Settings
The updater software is not working properly even after permission was granted in the firewall.	Momentarily disable the computer's firewall
Unable to perform the update (rare)	Try again with : Another USB Port or; Another USB cable or; A different computer
The message "Device Not Found" is displayed after pressing "FIND DEVICE"	Check that the tool is recognized by Windows. The update can be done when connected to a computer only. Do not connect the engine ECU at the same time or power the tool with an external source.

Table 7. Troubleshooting, updater software

If other difficulties arise during the firmware update, contact the manufacturer :
support@GAPInnovation.com

2.4.2 Language (coming soon)

You can choose between a firmware in French or English language in step 3, [section 2.4](#))

App: The language of the application is the same as that used by the mobile device. The firmware and the mobile device must be in the same language.

2.5 Synchronizing the Mobile App, Registering and tool binding

Purpose

Refresh files in the Mobile Application GAP Flasher to achieve consistency with the firmware of the newly updated tool ([section 2.4](#)) or prior to first usage.

Registering the unit with your personal credentials is done at the same time. This allows usage of sharing functionalities and viewing online logs when not connected to the tool.

Binding allows online functions to be used without the need to log in. You can also lock the tool which will prevent usage by another mobile device unless the password is entered.

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.*

2.5.1 Prerequisites

- Having access to a PC personal computer.
- Own a compatible mobile device ([section 1.5.2](#)) connected on the internet.
- The GAP Flasher App is installed and up-to-date ([section 2.3](#))
- The GAP Flasher firmware was updated ([section 2.4](#)) or a new mobile device is used with the tool for the first time.

2.5.2 Steps

Initial 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 or Linking to an existing account

- 5- If the user does not have an account, proceed with registering. This can also be done later if needed. Simply fill up the required field by clicking on Register.

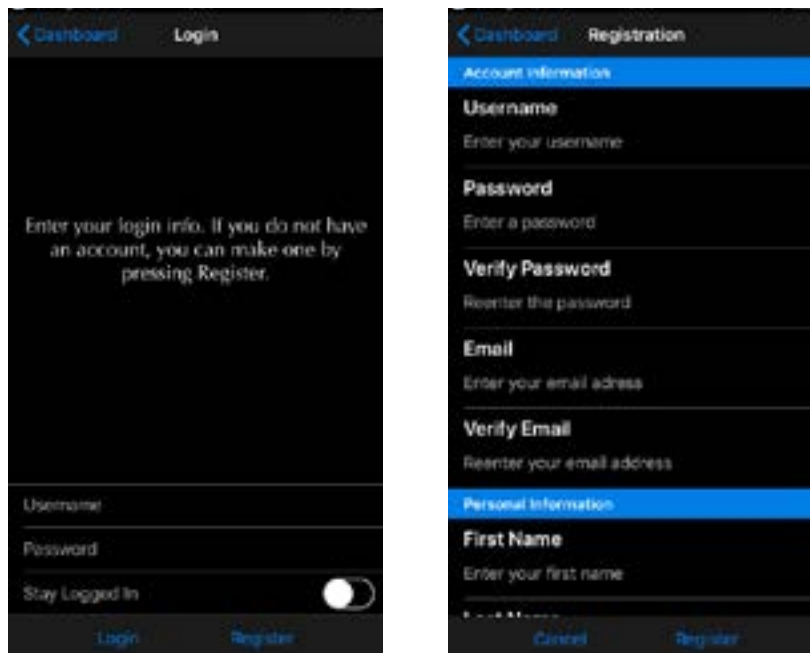


Figure 7. Registering

If the user already has an account, simply log in using your credentials.

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.

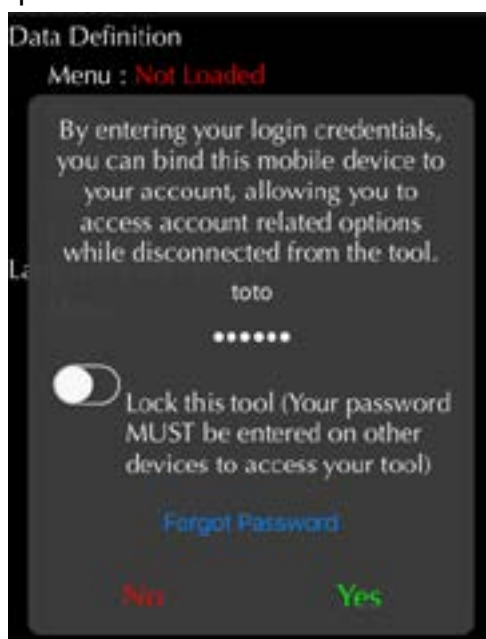


Figure 8. Tool Binding

- 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.

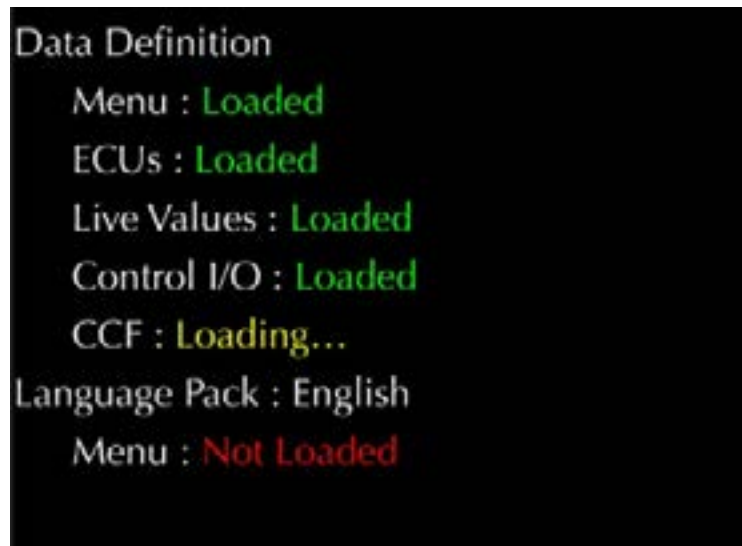


Figure 9. File download or synchronization

2.6 General operation of the GAP Flasher

This section explains how to connect the GAP Flasher to the vehicle, interface commands to navigate through the various interface menus and proper disconnection of the tool.

2.6.1 Connecting the GAP Flasher on the vehicle

Please refer to the installation guide found on the website.

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- Turn on the ignition.
- 2- Connect the tool on the vehicles as per the installation guide
- 3- Launch the mobile App of the GAP Flasher and navigate as described in the next segment.



WARNING

Prior to GAP Flasher firmware build 245, it was not designed to be left in place for long periods. Please unplug after use!

Leaving the GAP Flasher connected for long periods without the engine running will drain the vehicle's battery.

Note: From GAP Flasher firmware build 245, the tool can be permanently left connected without risk to the battery. It is recommended to disconnect the tool during the off season.

2.6.3 Disconnecting the GAP Flasher

The GAP Flasher can be disconnected at any time except:



WARNING

Do not disconnect GAP Flasher during an ECU flash as a breakdown or serious consequences could arise (descriptions of these functions and recovery methods are found in the re-flash section).

2.6.4 Mobile Application, Navigation and Controls

Definition

The App was developed by the manufacturer with user friendliness in mind.

Prerequisites

- Own a GAP Flasher
- Have access to the vehicle on which the tool will be used
- Own a compatible mobile device ([section 1.5.2](#)) on which the Bluetooth module is “activated” or “ON”?
- GAP Flasher App installed in the mobile device ([section 2.3](#)) and having synchronized it with the tool ([section 2.5](#))

Steps to navigate the Mobile Application

- 1- Proceed with connecting the GAP Flasher as per [section 2.6.2](#)
- 2- Launch the GAP Flasher App
- 3- Click on “Search for tool” at the bottom of the screen
- 4- Select the desired tool available in the list (“available tools”).

Mobile App representation

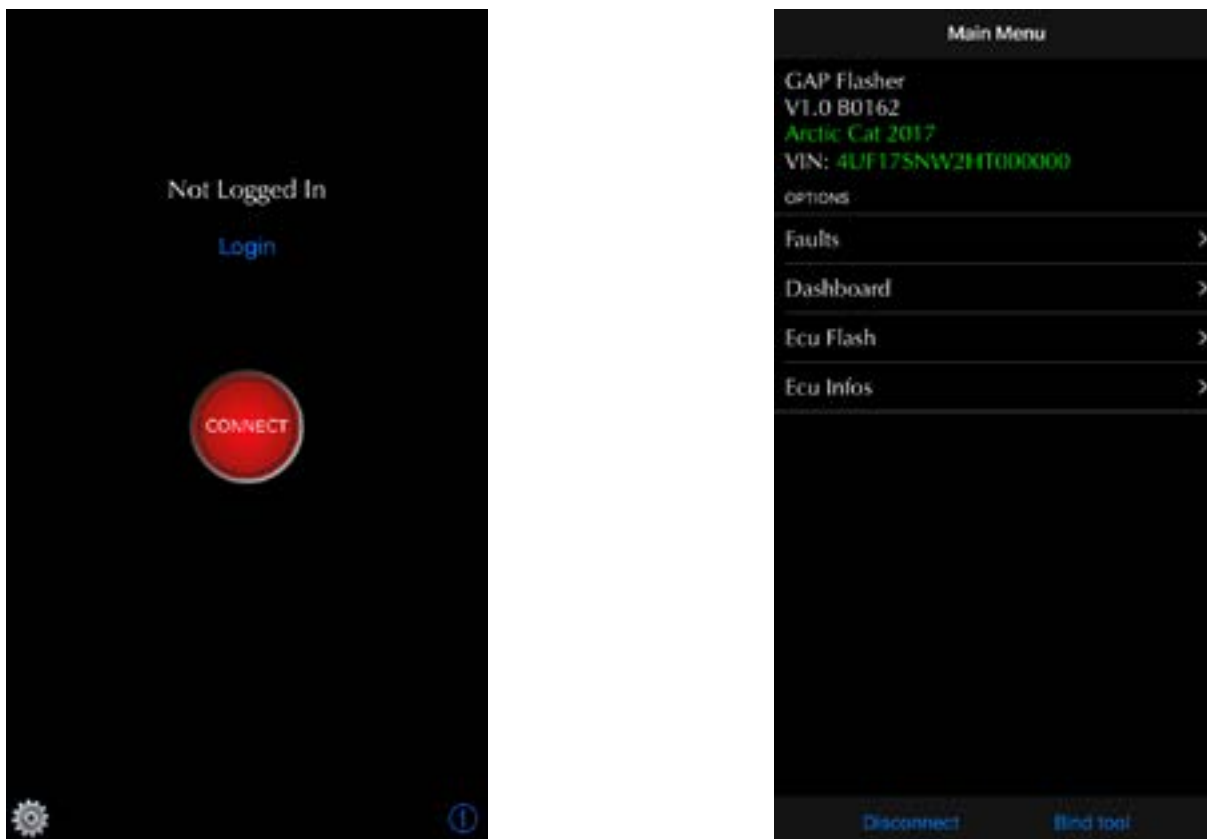


Figure 10. Mobile App representation

Important notes:

- It is not required to add the GAP Flasher to the Device List on the mobile device or to pair. The Application provides connectivity between the two.
- Disconnect from any other Bluetooth devices before using GAP Flasher.
- Deactivation of battery saver mode on Android is required for proper connection.

Language

The application is available in French and English. It automatically adjusts to the language of the mobile device.

2.6.5 App parameters

Access

The App Setting button is available on the top bar in the Dashboard function ([Section 3.1.3](#)).

Available parameters and description



Figure 11. Parameters definition

- **App Settings:** This presents settings related to the general App functioning.
- **Logs:** This will allow access to data saved by the optional datalogger module.
- **Online Logs:** View records shared by Friends and yourself.
- **Send bug reports:** This should only be used when an issue is present and GAP Innovation requires additional data for analysis purposes.
- **Unit Conversion:** Allows selection of imperial or metric units. Some values will remain at their initial unit, boost pressure, for example, is only available in PSI.

Available settings and description



Figure 12. Settings definition

A description of each setting is defined under the setting name. Some settings, Log automatically for example, will only work when the optional datalogger module is available on the said vehicle.

2.6.6 Login

Definition

Login in allows the use of certain functions, including online logs and sharing, when not connected to the tool.

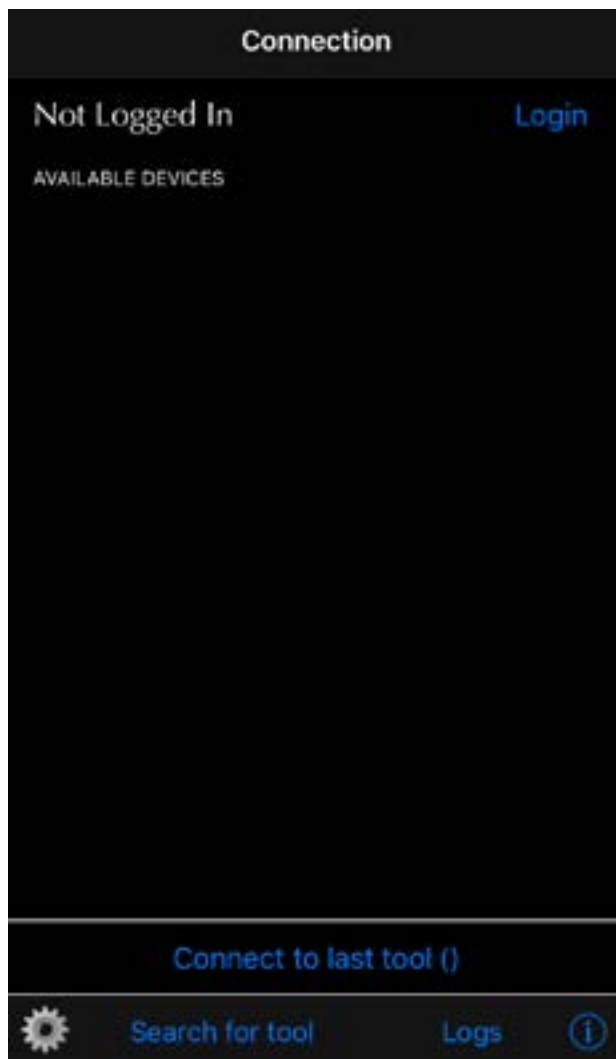


Figure 13. Login

3 «Dashboard» and features

3.1 Dashboard

3.1.1 Definition

This function allows viewing engine and vehicle data. Recording is sold separately.

3.1.2 Access

Simply click on the Dashboard option. The GAP Flasher will automatically enter this screen by default if set in the App settings ([section 2.6.5](#)).



Figure 14. Dashboard Phone layout example



Figure 15. Dashboard iPad layout example

3.1.3 Top Bar

Click on the green arrow on top of the screen to make the top bar appear.

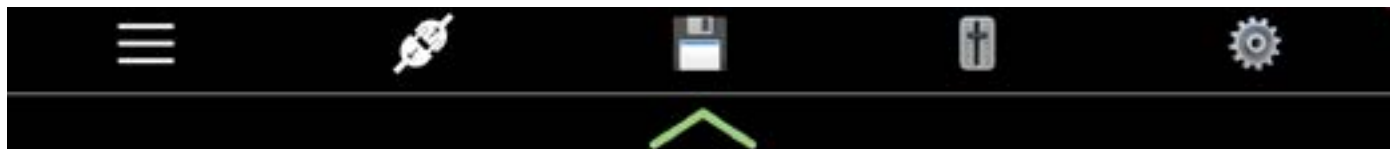


Figure 16. Dashboard Top Bar

Quit button

This button is to quit the dashboard and return to the main menu. Faults, ECU Info and ECU Flash functions are part of the main menu.



Disconnect button

This button is to disconnect from the GAP Flasher and return to the connection screen.



Record and Save buttons

These buttons will be visible when the optional datalogger was purchased for the vehicle on which the tool is connected.



Save button. This button will be visible when the Log automatically setting is activated ([section 2.6.5](#)) Pressing on this button will save the log and start a new recording.



Record button. This button will be visible when the Log automatically setting is not activated ([section 2.6.5](#)). Pressing this button will start the recording .



Stop button. This button will be visible when the Record button was pressed. Pressing this button will stop the recording.

Adjustments button

This button will be visible when the optional Anti-Lag or other items function was purchased for the vehicle on which the tool is connected.



App settings button

This button will show the setting screen. See [section 2.6.5](#) for more details



3.1.4 Bottom Bar

Click on the green arrow at the bottom of the screen to make the bottom bar appear.



Figure 17. Dashboard Bottom Bar

Allows changing of the layout between two options quickly.

3.1.5 Live values selection

Click on any of the live data fields to prompt the selection box. Available live values will depend on the vehicle and options.

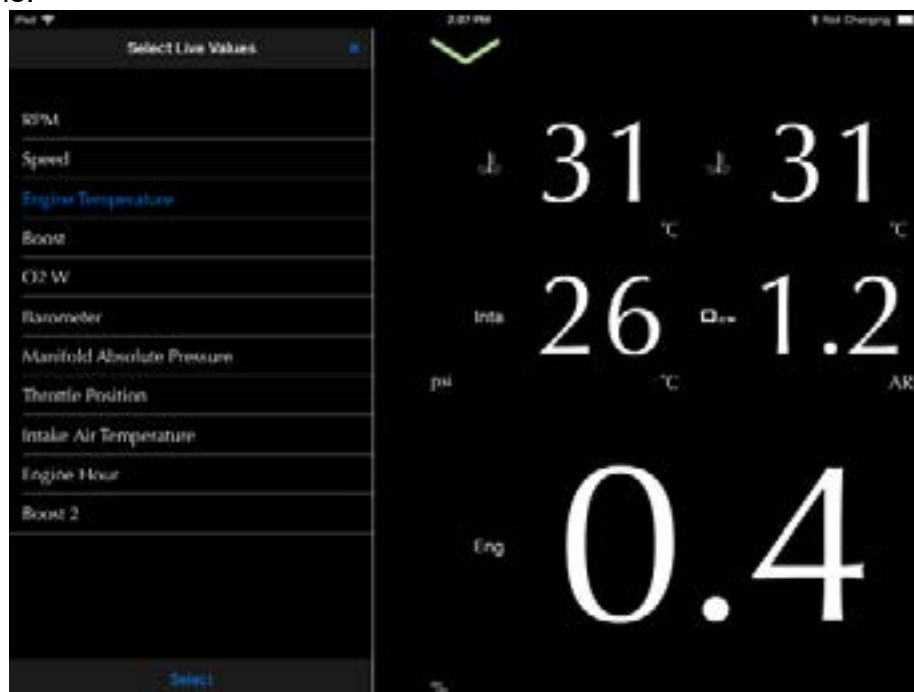


Figure 18. Live values selection

3.1.6 Layout of data fields

Press and hold on any of the four live data fields to prompt the layout selection box. The user can choose between one, two and four live values per field for up to 16 live values total.

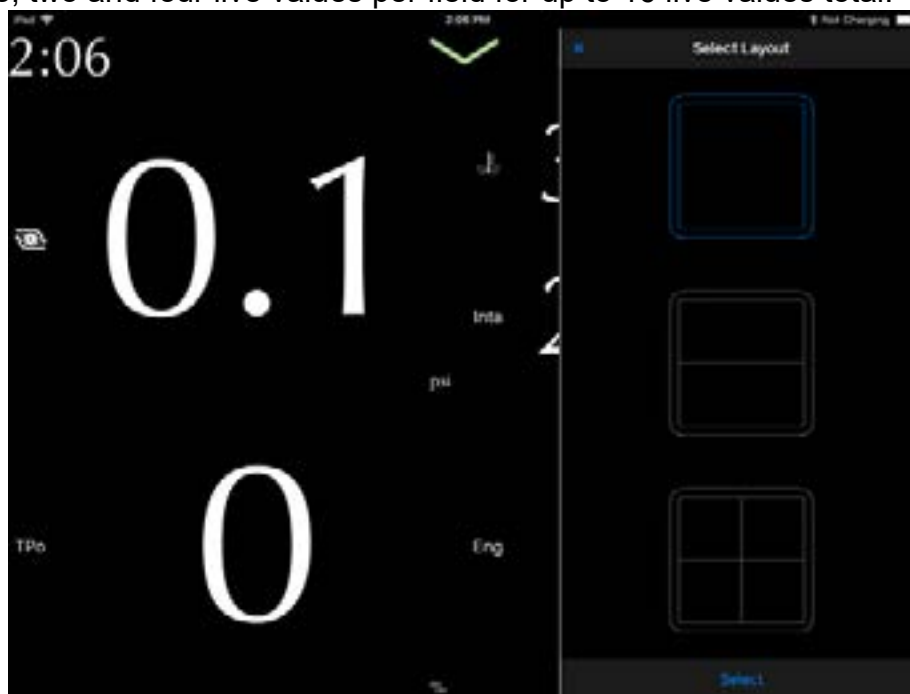


Figure 19. Layout of data fields

3.1.7 Exiting the dashboard

The dashboard can be exited at any time unless the engine is running. The tool will force return to the dashboard under this condition.

3.2 Optional features

Access

- 1- Perform the initial stages of access ([section 2.6.2](#))
- 2- Click on the “Adjustments”  button in the top bar while in the Dashbord. See [Section 3.1.3](#) for more details.

Changes are applied instantly.



This button is to revert changes back to the default values.

Save as Default

This button will set the current values as default.

3.2.1 Anti-Lag, V2

This menu will allow controlling parameters of the Anti-Lag function V2. Only the first Anti-Lag step can be adjusted. If needed, it can be aggressive enough so that step two is not required. Step two is not adjustable and it's parameters have been set by the tuner. Step two is very aggressive and shall be used with caution.

Note: Upgrading from Anti-Lag V2 to V3 is available. Please contact your Tune provider.



WARNING

Anti-Lag is for racing purposes only! Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher.

Frequent usage of the Anti-Lag function with a Wideband O2 sensor connected could damage the sensor. The sensor is not warranted.

Prerequisites

- Having purchased a remap with Anti-Lag and updated the engine ECU
- Having a GAP Flasher installed on the machine
- Having studied why Anti-Lag is used, the risks and necessary precautions
- Engine is running
- Anti-Lag parameters have been set
- Vehicle is on a race course
- Vehicle (track) Speed is below 5 kph
- Engine speed is below 2500 RPM
- Mobile App does not need to be connected to the GAP Flasher

Parameters list

- Fuel Override: The amount of fuel in %. 100% is equal to no change, 101 is equal to 1% more fuel.
- Boost Override: The boost target to be used for Anti-Lag
- Rev Limiter: The engine speed at which it will stay when Anti-Lag is in function and throttle applied sufficiently.
- Anti-Lag Timing Offset: Timing offset in degrees. 0 is no change.
- Anti-Lag TPS Step 1-2: The throttle position at which step 2 will be engaged. Not adjustable. Select 110% to disable step two.

Controls

The parameters are adjusted by the following sliders.



Figure 20. Parameters Anti-Lag V2

Using the Anti-Lag

Usage, high beam switch

- Press on the high beam switch to activate Anti-Lag
- Give throttle to spool the Turbo
- If set and required, proceed with Anti-Lag step 2 by positioning the throttle accordingly.
- Press on the high beam switch to launch

Usage, optional button

- Press and hold the button to activate Anti-Lag
- Give throttle to spool the Turbo
- If set and required, proceed with Anti-Lag step 2 by positioning the throttle accordingly.
- Release the button to launch

3.2.2 Anti-Lag, V3

Anti-Lag V3 offers automated control which provides the following advantages;

- Boost and RPM stability.
- Quick spooling.
- No need to adjust timing and fuel, the system gives consistent results regardless of conditions.
- Real time live data showing the target and current value of both RPM and Boost.
- Initial Boost and RPM target are easily set.
- Real time fine tuning.

Note: Upgrading from Anti-Lag V2 to V3 is available. Please contact your Tune provider.



WARNING

Anti-Lag is for racing purposes only! Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher.

Frequent usage of the Anti-Lag function with a Wideband O2 sensor connected could damage the sensor. The sensor is not warranted.

Prerequisites

- Having purchased a remap with Anti-Lag and updated the engine ECU
- Having a GAP Flasher installed on the machine
- Having studied why Anti-Lag is used, the risks and necessary precautions
- Engine is running
- Anti-Lag parameters have been set
- Vehicle is on a race course
- Vehicle (track) Speed is below 5 kph
- Engine speed is below 2500 RPM
- Mobile App does not need to be connected to the GAP Flasher except if fine tuning is required

Controls

The following parameters can be adjusted;

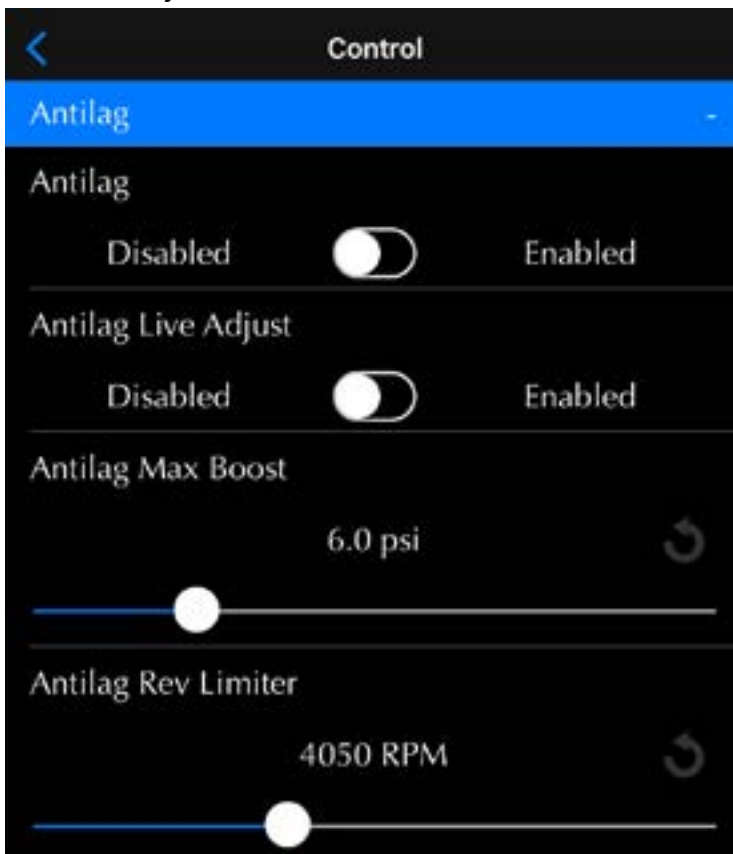


Figure 22. Parameters Anti-Lag V3

- Anti-Lag Enabled / Disabled
- Anti-Lag Live Adjust Enabled / Disabled
- Anti-Lag Max Boost: The boost target to be used for Anti-Lag
- Anti-Lag Rev Limiter: The engine speed at which it will stay when Anti-Lag is in function and throttle applied sufficiently.

Using the Anti-Lag

Usage, High Beam switch

- Press on the high beam switch to activate Anti-Lag
- Give throttle to spool the Turbo
- Release the throttle and fine tune the targets if required (Anti-Lag Live Adjust set to Enabled)
- Give throttle to spool the Turbo
- Press on the high beam switch, release to launch

Usage, Optional Button

- Press and hold the button to activate Anti-Lag
- Give throttle to spool the Turbo
- Release the throttle and fine tune the targets if required (Anti-Lag Live Adjust set to Enabled)
- Give throttle to spool the Turbo
- Release the button to launch

Anti-Lag Live Adjust

When Anti-Lag and Anti-Lag Live Adjust are enabled, the App dashboard will automatically switch to the Anti-Lag Live Adjust screen.



Figure 23. Anti-Lag V3 Live Adjust

Targets, bottom, can be adjusted in real time.

3.2.3 Closed Loop Fuel Control

The closed loop fuel control will ensure consistent air fuel ratio regardless of ambient conditions. This engine's ECU algorithms were designed to run on an open loop configuration. In turn, fueling is not optimal due to various ambient conditions. Adding a wideband O2 sensor and proper closed loop algorithms in the ECU ensures consistent and optimal fueling thus providing;

- Maximum engine power delivery in all ambient conditions at high and full throttle
- Automatic compensation relative to the hardware configuration (intake, exhaust)
- Eliminates insufficient fueling in extreme cold or over fueling in hot ambient temperature
- Increased fuel economy while cruising at low throttle

Prerequisites

- Usage of the optional AEM or ECU Master Wideband O2 module (pre-wired and plug in) is required.
- Having purchased a remap with Closed Loop Fuel Control and updated the engine ECU.
- Having enabled the closed loop control.

Notes;

- Works as a stand alone system. The GAP Flasher does not need to be connected to the vehicle once the controller has been implemented.
- The closed loop air fuel ratio has targets for both cruising and full throttle situations. Cruising AFR target is leaner to provide better fuel economy without any risks while a richer target is used at full throttle.
- The closed loop can only operate within the range allowed by the fuel system, intake, exhaust and other hardware configurations.
- Failsafe protections have been implemented in the event of a sensor issue.
- AEM broadband O2; It is normal for an error code to appear on the instrument panel after starting the engine. This code disappears when the module sends a valid value. If the fault is present permanently, the O2 sensor or the module is defective or a wiring issue is present.*
- ECU Master: If the fault is present permanently, the probe or the module is defective or a wiring issue is present.*

* Arctic Cat, the code is P0130

Yamaha, SD24

Controls



WARNING

Closed loop target adjustments shall only be performed by informed users who understand the effect of the air/fuel mixture.

Damages or improper performance can occur if not properly adjusted. Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher or a tune.

The following targets can be adjusted:

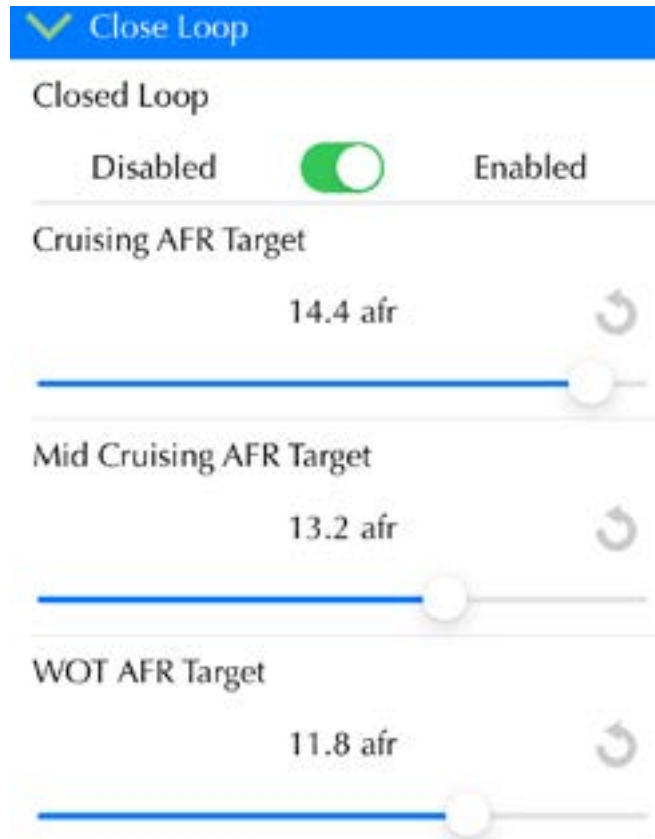


Figure 24. Parameters Closed Loop

- **Cruising AFR Target:** Low throttle and slow speed.
- **Mid Cruising:** Part throttle, needs to be set at a safe value for high speed cruising.
- **Wide Open Throttle:** High and Full throttle value, leaner for more power if the tune and fuel allow it, richer for a more safe operation.

Notes; Controls for closed loop values provided by the tuner on selected tunes only.

3.2.4 Boost Timer

The boost timer allows increasing boost gradually from the tune target boost to a defined value. This allows a smoother power delivery thus having more power at the end of a run.

Prerequisites

- Having purchased a remap with Boost Timer and updated the engine ECU.
- Having enabled and configured the Boost Timer.

Controls

Let's consider a tune boost target of 10 PSI for example:

- **Boost Max Increase:** This is the additional boost which will be added to the tune boost target. If the Boost Max Increase is set to 2, the final boost will be 12 PSI.
- **Start Speed:** The speed at which the boost timer will start to act. In this example, 150 kph. The boost target will be 10 PSI from 0 to 150 and start to increase passed 150 kph.
- **Total Duration:** The time required for the maximum boost increased to be applied. In this case, the boost will take 3.4 seconds to go from 10 PSI to 12 PSI once the speed is higher then 150 kph.

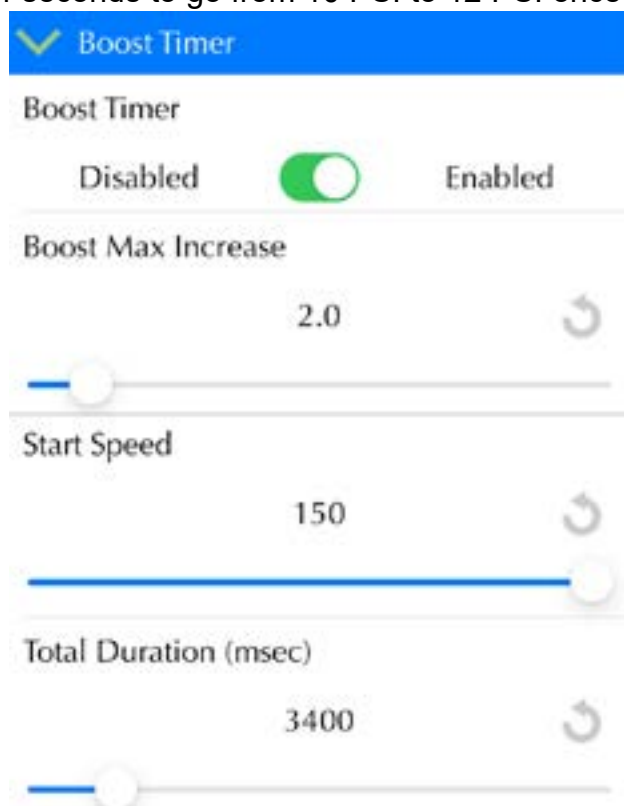


Figure 25. Boost Timer Configuration

Notes;

- Once the Boost Max Increase has been reached, the boost target will remain at this value until the throttle is released and speed lowers below 150 kph. In this case, 12 PSI.
- There is a default time limit of 20 seconds (can be adjusted by the tune provider). If the max boost increase has been reached for more than 20 seconds, the boost will be lowered to the tune target boost, 10 PSI for this previous example.

3.2.5 « Datalogger »

Definition

The datalogger function allows recording and visualization of engine data. The datalogger is optional and purchased separately. Please contact your remap provider for more details.

You can select up to 16 live values in the graph display modes. The sampling rate for each value is 10 per seconds and 30 per seconds for the optional AEM Wideband O2 sensor(s).

All available live values are recorded. An optional wideband Air Fuel Ratio sensor is available.

Creating a log

Recording will start automatically or manually depending on the state of the associated setting (see [section 2.6.2](#)), else manually started ([Section 3.1.3](#)). Logs will be saved automatically when turning the engine off.

Viewing logs

Once a log has been made, click on the Logs button on the connection screen or go into the App Parameters ([section 2.6.5](#)) by clicking on the Cog wheel and select Logs.

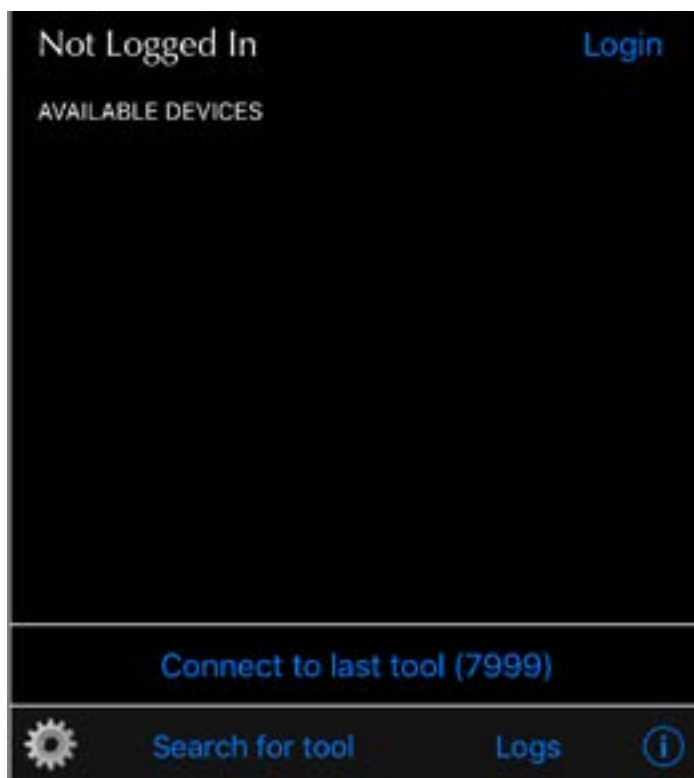


Figure 26. DL : Log Access

Select a log and click on View

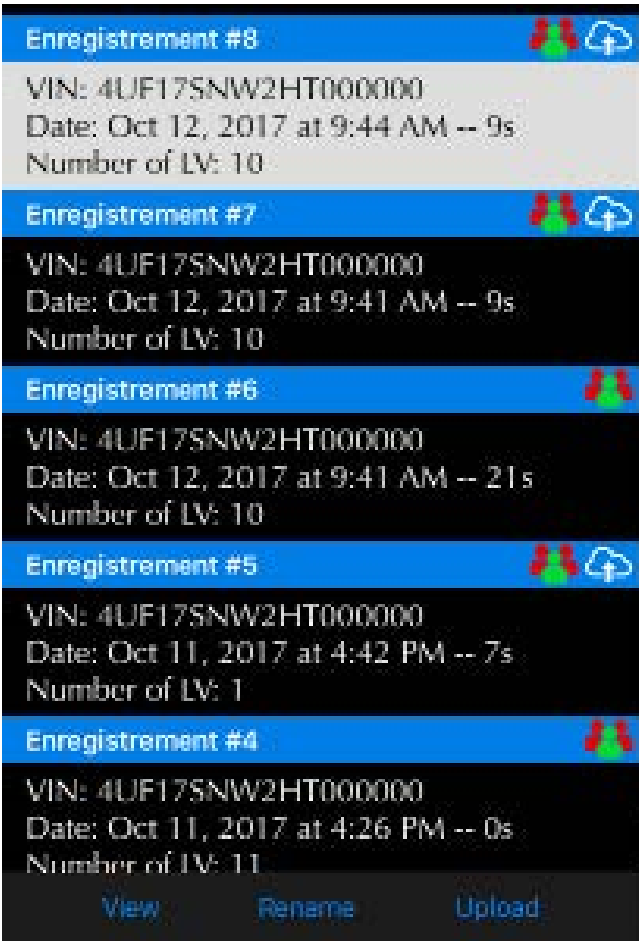


Figure 27. DL : Viewing log selection

Basic control

Click on the yellow area to show the top bar

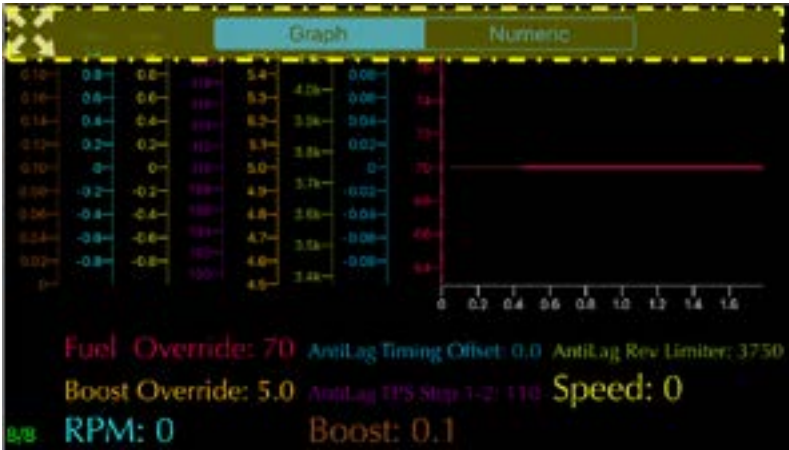


Figure 28. DL : Top bar



Full screen / split screen button



Toggle between Graph or Numeric views. The numeric view shows all value at a defined point (cursor, see next page)

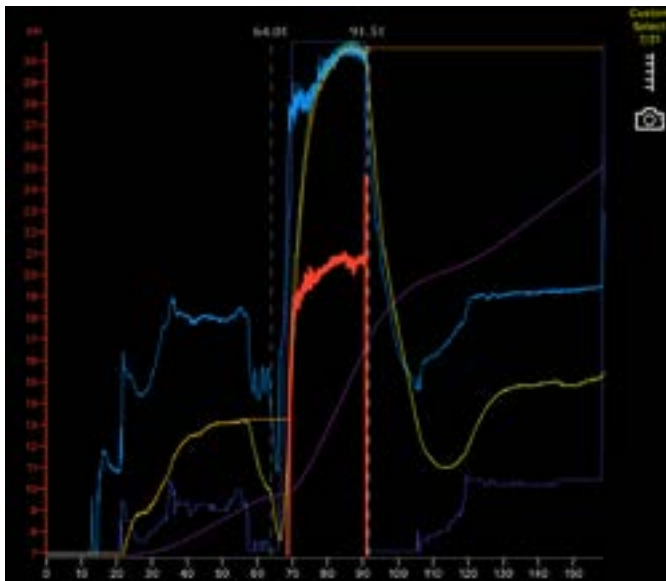


Figure 29. DL : Right quick options

Custom Select 8/16

This button selects the values to display and export.



Axis Layout; The Y axis and names are displayed. All data will remain visible on the graph. This has been implemented to maximize the available graphic area.



This button is used to take a screenshot which will be stored in your photos.

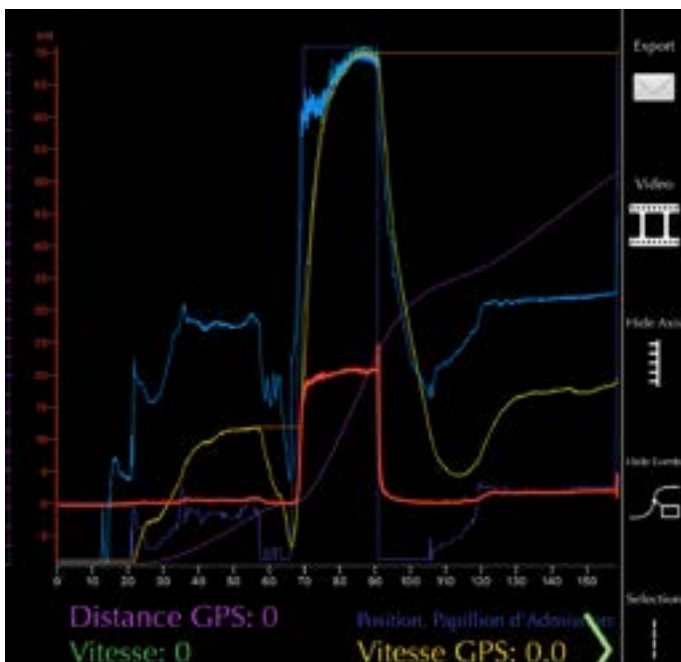


Figure 30. DL : Right bar

Click on the green arrow, bottom right, to access the right bar



Export button, csv, PDF, Air Print or Create a new log with the current view.



This button is not available on GAP Flasher (CoPiTrail only).



To remove or show Events, see next page



Cursor selection, one or two cursors. Having two cursor allows Delta (difference) measuring between two different time.



Events example on the right

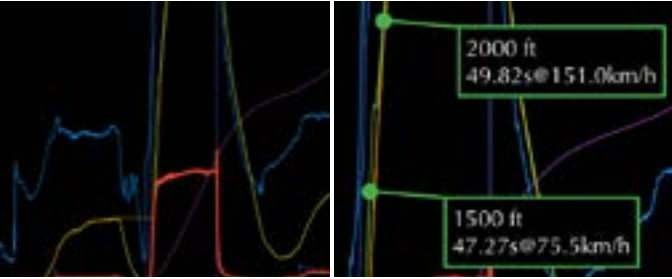
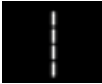


Figure 31. DL : Events button



Two cursors. Click and drag on the desired cursor to move it.

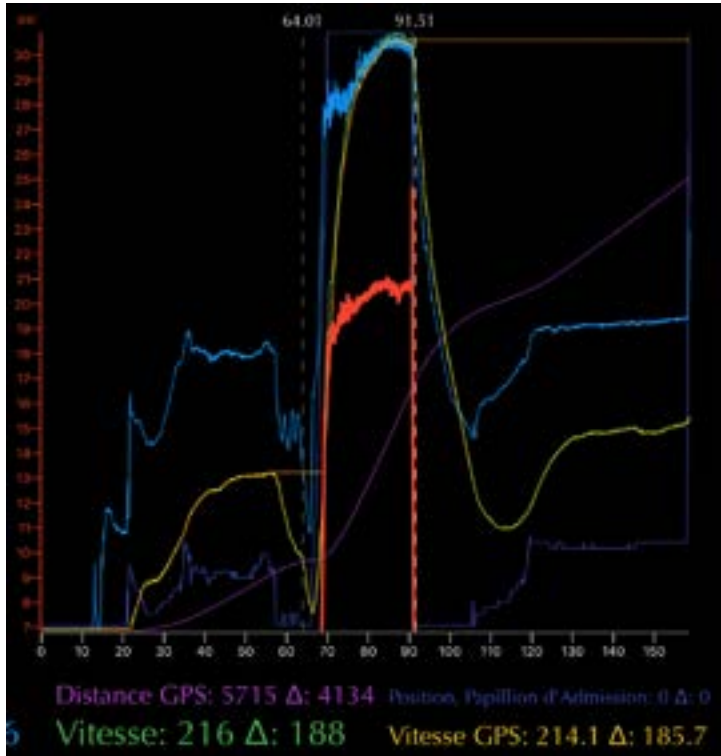


Figure 32. DL : Two cursors

Graph view options

Press in the yellow area to select how many live values Y axis and names are displayed. All the data will remain visible on the graph. This was implemented to maximize available graph area.

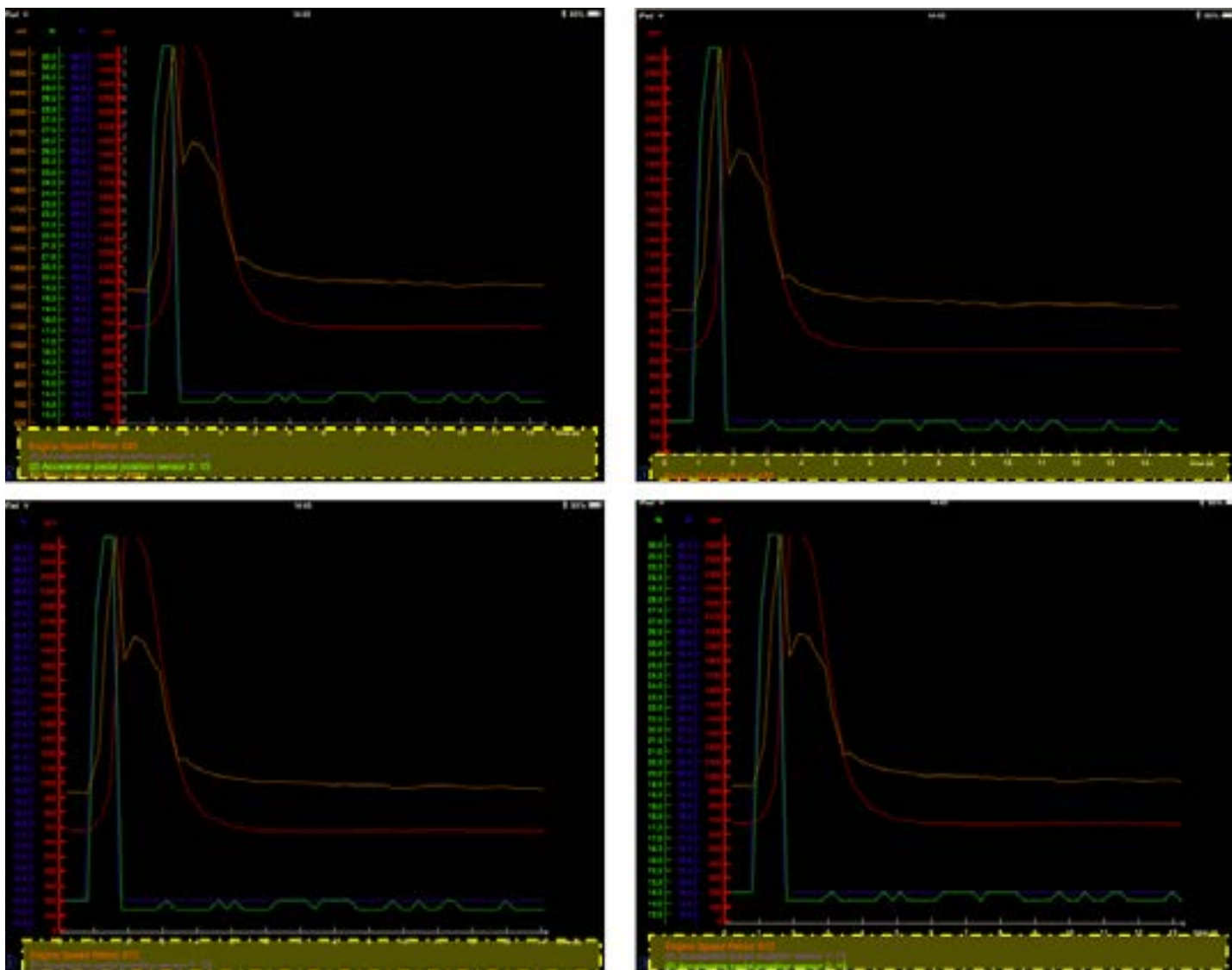


Figure 33. DL : Axis displayed

User can interchange any Y axis position. Press and hold on the desired axis and move it to the new position.

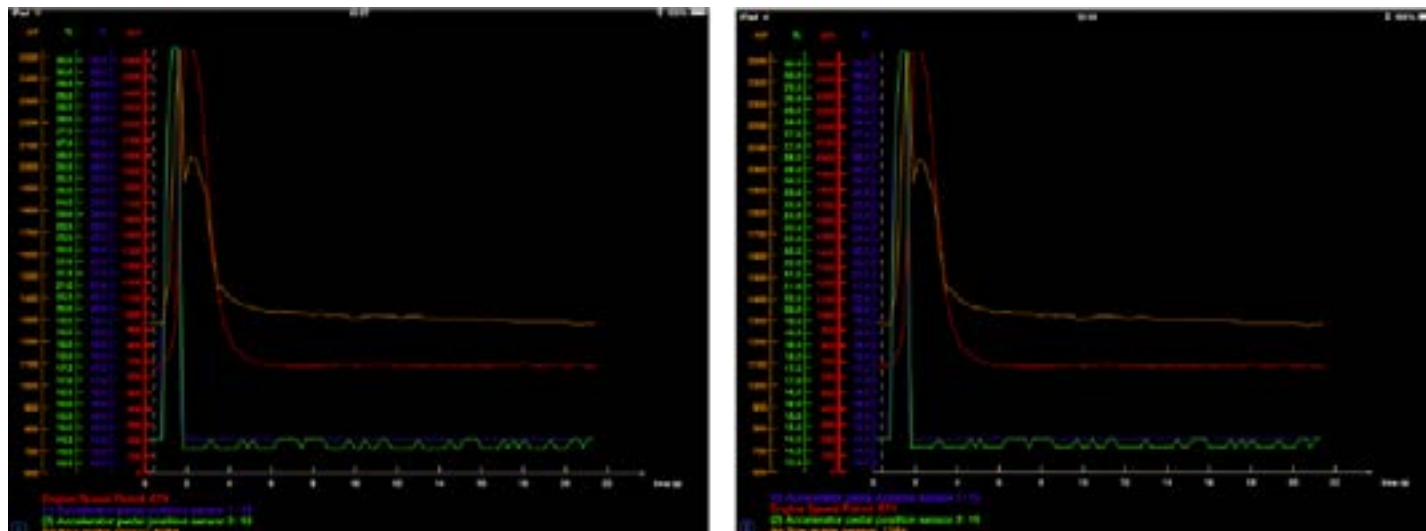


Figure 34. DL : Y axis displacement

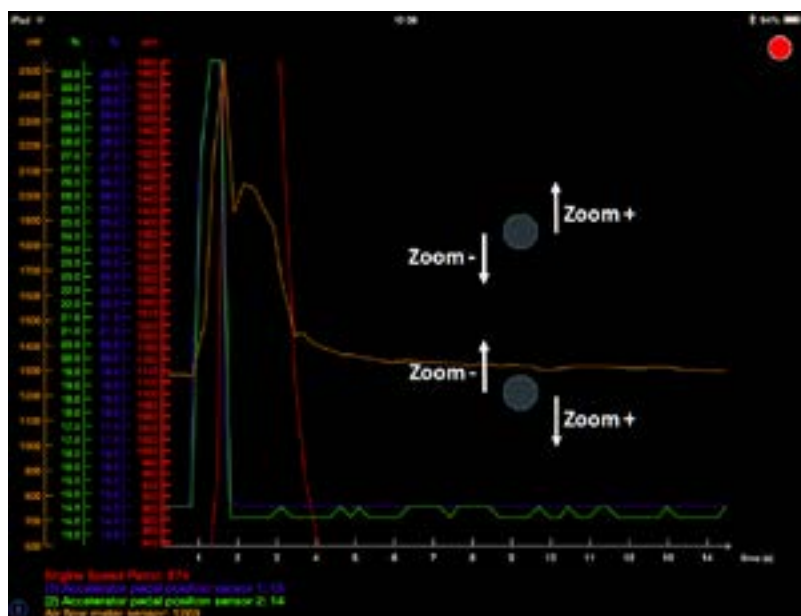


Figure 35. DL : Vertical zooming

Vertical zooming is done on each Y axis separately.

- Select the desired Y axis / live value
- Touch and hold anywhere on the screen with 2 fingers and swipe vertically in opposite directions.

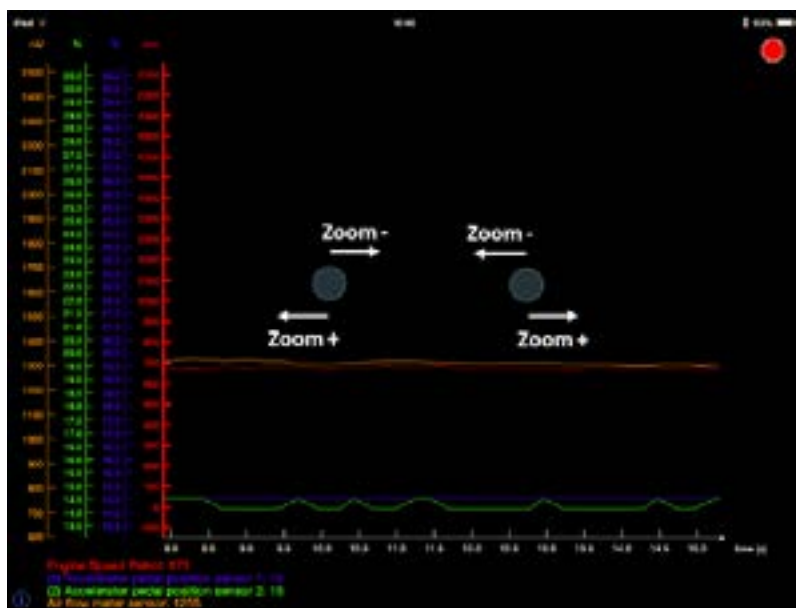


Figure 36. DL : Horizontal zooming

To zoom horizontally, press the screen with 2 fingers and swipe horizontally in opposite directions.

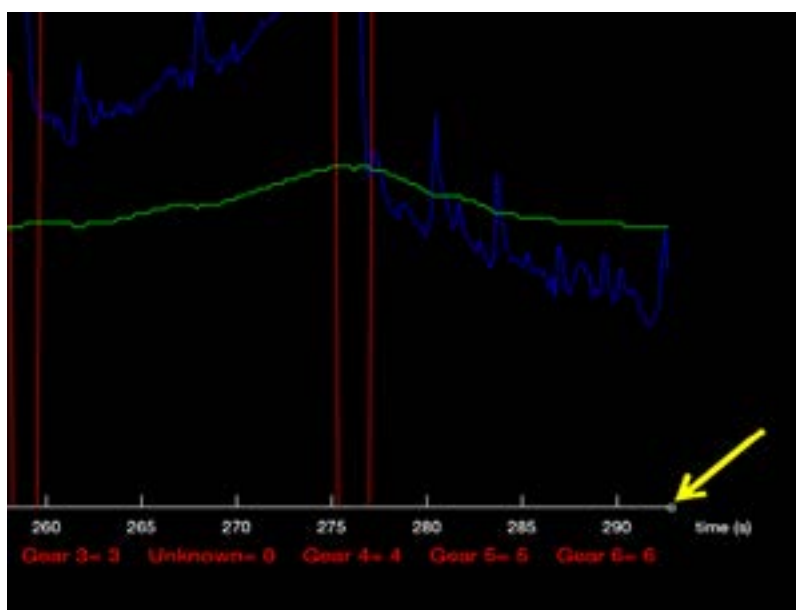


Figure 37. DL : Return to the current time

To return to the current time after zooming or panning horizontally on the X axis, simply press on the white square on the edge of the axis or the End button on later App version

The Pan function for both axis is done using only one finger and sliding it in the desired direction.

To re-initialize the graph view, touch the screen twice at one of the following locations:

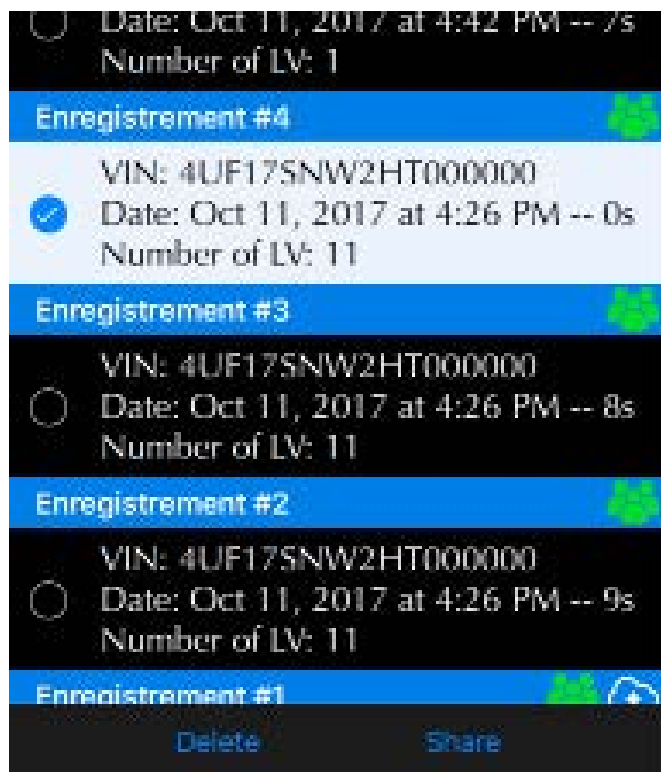
- On the currently selected Y axis to reinitialize this live value axis only.
- On the X axis to reinitialize the time axis only.
- In the middle of the graph screen to reinitialize all axis simultaneously.

Sharing Logs

Logs can be shared between users. Logs can only be shared with someone who bought a GAP Flasher from the same tune provider. Logs from different tuners cannot be shared.

Access

In the log section, select one or multiple logs and click on Share or Upload. Once completed, a copy of the log will be available online for consulting on another mobile device or by your friends using the Online Log function.



This symbol indicates that you are the owner of this log therefore it can be shared at will with friends.



This symbol indicates that it is already on the server.

The Share button will prompt the sharing screen.



This symbol indicates that you are not the owner of this log therefore it can only be uploaded on the server and then viewed by the owner only.

The upload button will upload the log which will be available only to the owner.

Figure 38. DL : Log sharing

Sharing to friends



Select the friends you wish to share the log with and click on share.

Click on *Manage Friends* to add or remove friends from your list. See below.

Figure 39. DL : Log Sharing screen



Enter a user name, same as the one used to register the tool, or e-mail and click on Validate. If a match is found, it will be added to the list.

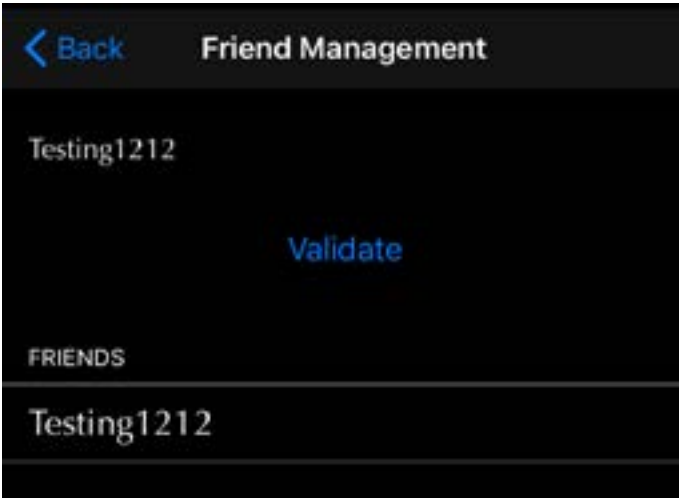


Figure 40. DL : Log Sharing screen

Online Logs

The Online Log function allows visualization of logs stored on the server. Logs from the owner and friends which were shared will be visible even when not connected on the GAP Flasher.

Viewing logs

The online logs function is part of the App Parameter menu, [section 2.6.5](#). User must either be connected on the GAP Flasher or logged in ([section 2.6.6](#)).

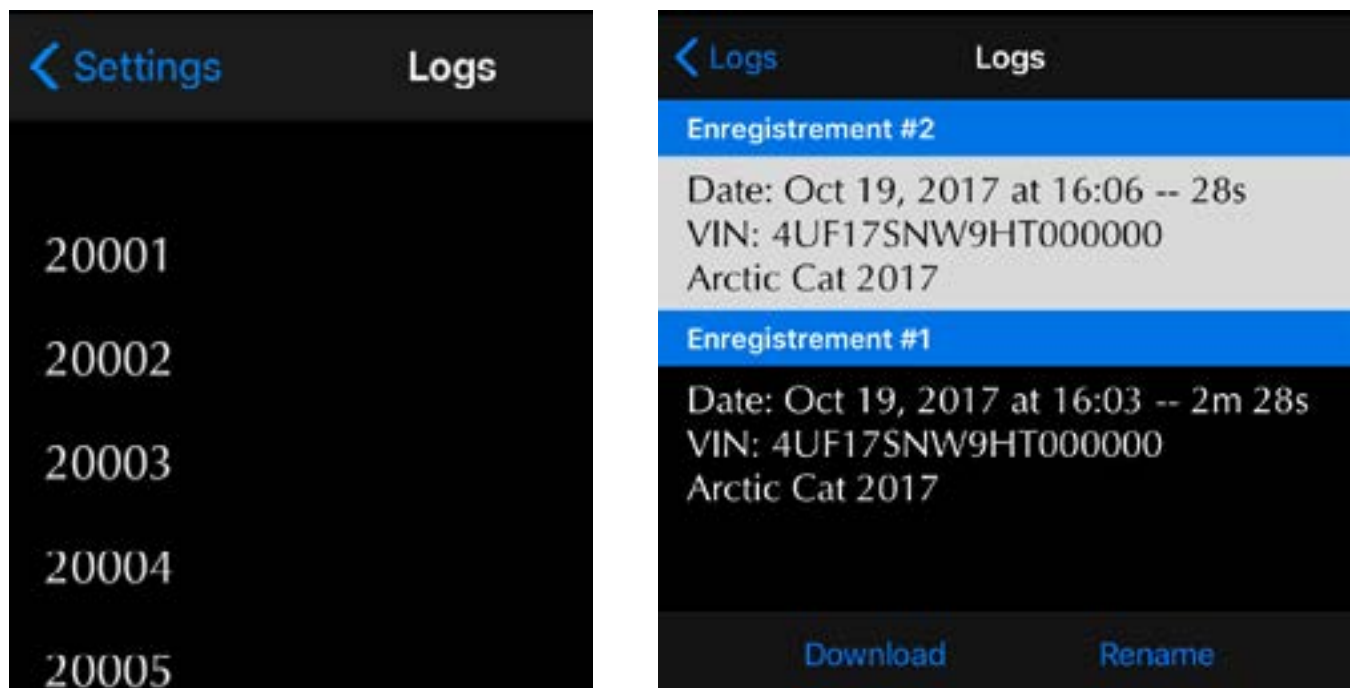


Figure 41. DL : Viewing online logs

Click on *Download* to view the Log and *Rename* to change the log name. The name will be changed on the server thus for all other people who can view it.

3.3 Standard Features

3.3.1 Tune Jukebox

The Tune Jukebox function makes it possible to change the engine map when the engine ECU has been updated with this function. Contact your Tune provider for further details.

Mobile App

The Tune currently selected and visible at the top left of the screen:

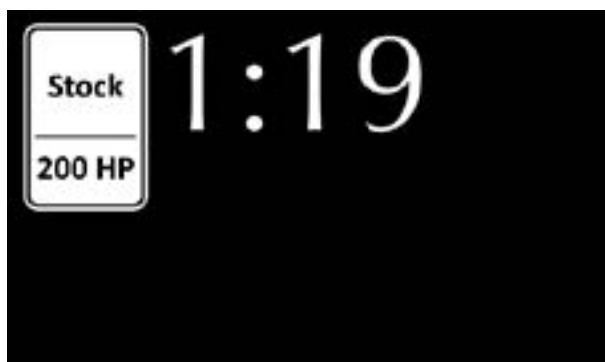


Figure 42. Tune Jukebox

Click on the icon to choose another Tune. Si le paramètre *Montrer l'image du Jukebox*, [section 2.6.5](#), est désactivé, cliquez sur l'horloge pour appeler le Jukebox. The Covers give details on the map:



Figure 43. Tune Jukebox, covers and selection



Click on the arrows to see the different covers.



Click on the X to Cancel



Click on the check mark to Apply



Click on the Cog Wheel to choose which covers will be part of the JukeBox

Save as Default

This button is used to save the Tune that will be applied by default when starting the engine. This will only be applied when the GAP Flasher is connected on the snowmobile.

Note: *The engine ECU will automatically set the lowest power tune when the GAP Flasher is not connected on the snowmobile. This is a safety mechanism in case bad fuel is present and the user cannot select the proper tune.*

Original instrument cluster

Prerequisites

- Have purchased the optional instrument cluster upgrade.
- Use the latest firmware version of GAP Flasher, latest engine tune and instrument cluster firmware versions, see [section 5](#).
- That the GAP Flasher is connected to the vehicle. It is not necessary to connect the mobile device to the GAP Flasher.

Viewing

The current tune can be seen at the top left corner of the instrument cluster. The default tune will be shown when the engine is started.

Note: If the current tune is not displayed, the Instrument Cluster or engine ECU needs updating. Please consult [section 5](#).

Selecting

The currently selected map is displayed on top left of the left cluster screen. Press the top left switch to select the next available tune. The selection is automatically applied. On 2019 and up, the handlebar button will also switch the tune.



Figure 44. Tune Jukebox, dashboard and 2019 and up selection

Changes in the OEM controls

In order to use the top left instrument cluster, we had to change the behaviour of this button. On a non-modified cluster, pressing the top left button allows changing the left screen label. On a modified cluster, the button must be held for 2 seconds for the value to change.

Using the optional button

Press the optional button to call up the Jukebox and see the currently selected cover (map) when using the mobile App. Press again to see the other covers. The selection is automatically applied.

The changes are also visible on the instrument cluster display when this option was purchased and installed.

Note: *If AntiLag was purchased and applied, the engine must be stopped or speed greater than 10 kph in order to change the tune. Else, AntiLag will prevail when the engine is running and speed lower than 5 kph.*

3.3.2 Active knock protection

The active knock protection consists of a knock-warning system and a knock protection algorithm which acts on engine control parameters to stop the engine from knocking. The GAP Flasher does not need to be connected on the vehicle in order for these items to work.

	WARNING <i>The active knock protection is not a substitute for usage of proper fuel quality and other requirements for the tune being used.</i> <i>Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher, the protection algorithms or a tune.</i>
--	--

Warning system

When knock is detected, the warning system will be visible on both the mobile devices (phone or tablet) and the original instrument cluster.

- The mobile device screen will flash and the words “knock detected” will be shown on screen.
- The low oil and temperature warning lamps of the original instrument cluster will flash indicating knock detection

Knock protection

The knock protection algorithm will control both the timing and boost variables in order to eliminate the knock thus protecting the engine from damage.

A restart of the engine is required in order to eliminate the applied changes (boost reduction and timing) made by the knock protection algorithm. Make sure the condition(s) creating knock is (are) eliminated before holding throttle wide open or change to a lower power tune to prevent further knock events.

Knock system enabled confirmation

On tunes with Active knock protection, upon turning ON the ignition, the engine ECU will confirm that the Active knock protection is enabled.

- The mobile device screen will flash and the words “knock protection enabled” will be shown on screen.
- The low oil and temperature warning lamps of the original instrument cluster will flash twice.

	WARNING <i>User should depress the throttle upon being warned of the presence of knock. Failure to do so, even with protections, could result in engine damage.</i> <i>Neither GAP Innovation nor the tuner shall be held responsible for damages incurred while using the GAP Flasher or a tune.</i>
--	---

3.3.3 Instrument Cluster Data Display

Without optional Instrument Cluster update

This function will display boost pressure or air fuel ratio (AFR) from the optional AEM O2 wideband real-time sensor to the original instrument cluster.

Prerequisites

- Use the latest firmware version of GAP Flasher and latest tune version
- That the GAP Flasher is connected to the vehicle. It is not necessary to connect the mobile device to the GAP Flasher
- For air fuel ratio, that the optional sensor is installed and GAP Flasher connected.
- For all other possible options: the mapping display, the option to set up a combined instrument must have been purchased and installed.

Viewing

Simply select the hour counter using the button at the bottom right of the instrument cluster.



Figure 45. Display, hour counter



Figure 46. Optional AEM O2 broadband sensor, 11.3 AFR in this example

Note: The power level is displayed temporarily when starting the engine. P0240 on the hour meter indicates 240 CV.

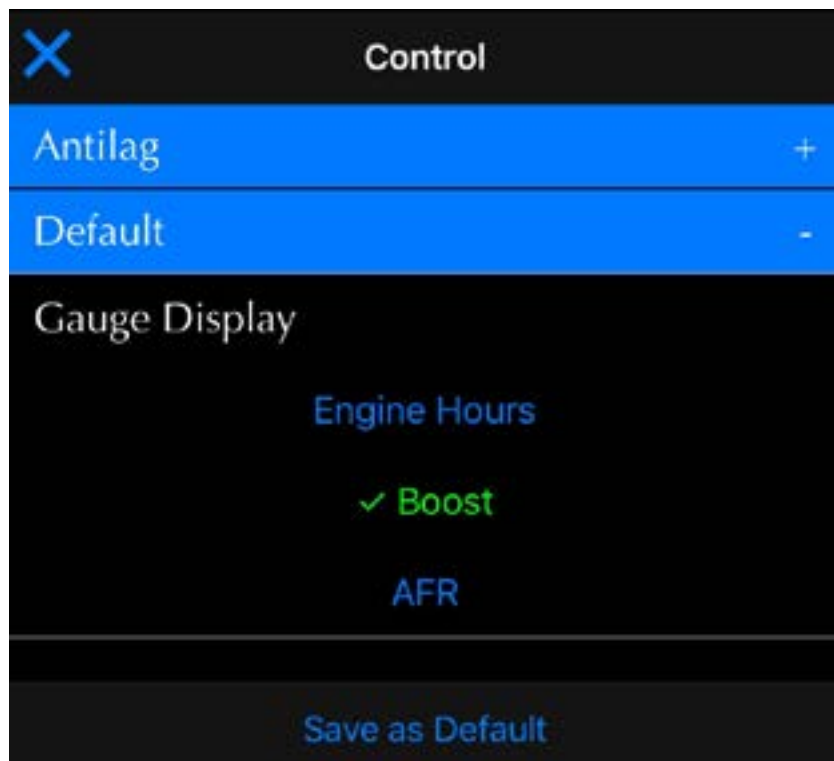


Figure 47. Value selection, hour counter

Click on Save As Default to make this choice appear when the engine is started.

Note: The default value when the GAP Flasher is not connected to the vehicle is the boost pressure.

With optional Instrument Cluster update

This function will display boost pressure or air fuel ratio (AFR)* from the optional AEM O2 wideband real-time sensor to the original instrument cluster. The values are bigger compared to the one not requiring the ECU update

*Available on the V2 and up version of the cluster update (available from october 2019).

Prerequisites

- Purchased and applied the latest instrument cluster firmware version and engine tune.
- Latest tune is applied to the engine ECU.
- For air fuel ratio, that the optional sensor is installed and GAP Flasher connected.

Viewing



Figure 48. Left screen data display

Figure 49. Right screen data display

Left screen

Press 2 seconds on the top button to change the currently viewed value. Press and release immediately to change tunes.

Right screen

Press and release the top button to change the currently viewed value.

4 Functions definition

4.1 «Faults» function

This function is subdivided into 2 sub-functions, that is; «Fault Reading» and «Fault Clearing».

4.1.1 Definition

This diagnostic function gives access to the list of currently stored faults in covered ECUs. It helps, following the reading, to identify the source of the problem.

4.1.2 Access

Simply click on the Fault option. The GAP Flasher will automatically scan the engine ECU to detect the presence of faults.

Buttons :

Definition :



or*



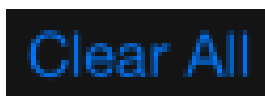
This button will export the list of faults.



or*



When this button is pressed, the GAP Flasher will scan ECUs (“refresh”).



This button clears all faults

*Apple or Android

4.2 « ECU Flash » function



CAUTION

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.

4.2.1 Definition

This function allows updating the engine and/or Instrument cluster ECU firmware to the latest available version or with a modified mapping.

Access

- 1- Perform the initial stages of access ([section 2.6.2](#))
- 2- Select the "ECU Flash" function
- 3-
 - If a tune, add-on or upgrade was purchased on the tune provider website thus the license form filled and/or a new firmware version is available, choose **Online ECU Flash**, select the ECU and file. The file will automatically be downloaded from the server to the mobile device and flashed to the engine or instrument cluster ECU. The GAP Flasher does not need to be updated in this scenario.
 - If using the old method with the updater software [section 2.4](#), select the file to be flashed.

Notes:

- Please see [section 5](#) for all steps required. From purchasing to finalizing steps.
- *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**.

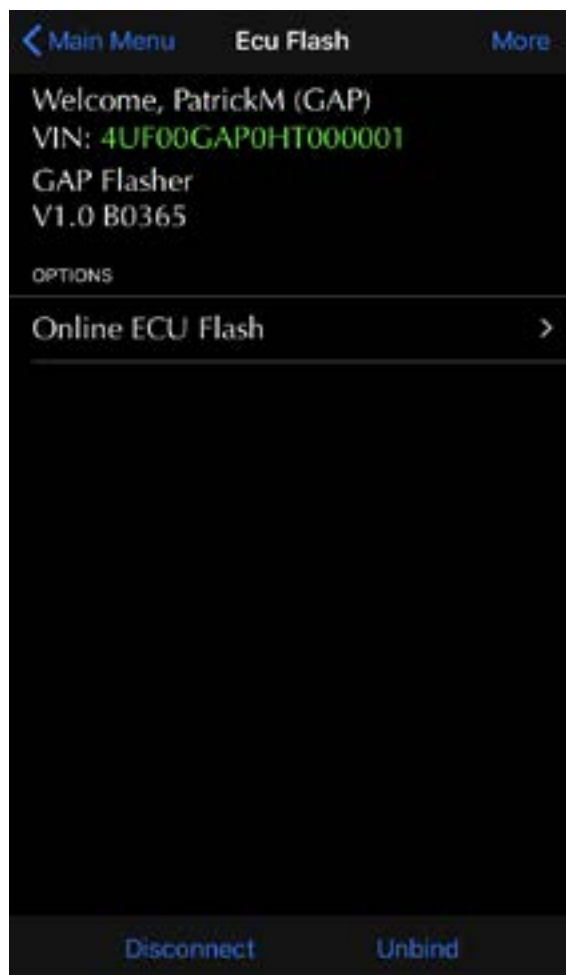


Figure 50. ECU Flash fonction

When finished, disconnect the tool from the vehicle and turn off the ignition. The ECU is now updated.



WARNING

If the vehicle is equipped with the optional wideband sensor module, it shall be disconnected prior to flashing the Instrument Cluster ECU. Failure to do so may prevent proper flashing and render the instrument cluster inoperative.

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.

4.2.2 Recovery method

The firmware of the GAP Flasher has an algorithm to recover an ECU following a failed update. This is particularly useful when the ECU no longer answers diagnostic commands. In such cases, the GAP Flasher detects this condition and will activate the recovery method. Just follow the instructions on screen and when the message "Toggle Fuse" is displayed, disconnect and reconnect the fuse that powers the ECU. The tool detects the fuse insertion and starts the update automatically.

4.3 « ECU Info » function and « License »

4.3.1 ECU Info and layout

Definition, ECU Info

This function allows viewing the following information of the selected ECU:

- Strategy
- Calibration
- ECU Serial number
- VIN
- Tune currently flashed
- Others

Definition, License

This allows filling in the form describing the vehicle's parameters (muffler type, pressure sensor etc) when a tune to update the engine ECU has been purchased.

Prerequisites, License

The GAP Flasher firmware must be at Build B0760 or higher to use the license functionality. Please consult [section 2.4](#) for how to update the GAP Flasher.

Access and sending ECU Info

- 1- Perform the initial stages of access ([section 2.6.2](#))
- 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

4.3.2 Licenses

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 51. Editing a License

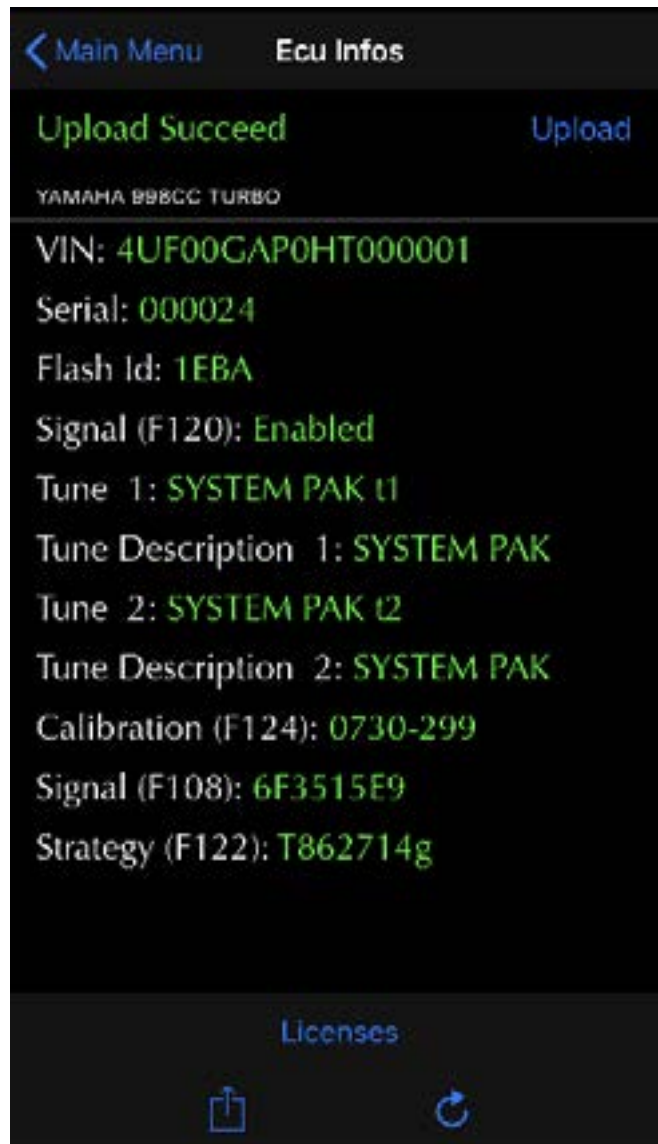


Figure 52. ECU Info example

Access the License list

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

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 3, *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*.

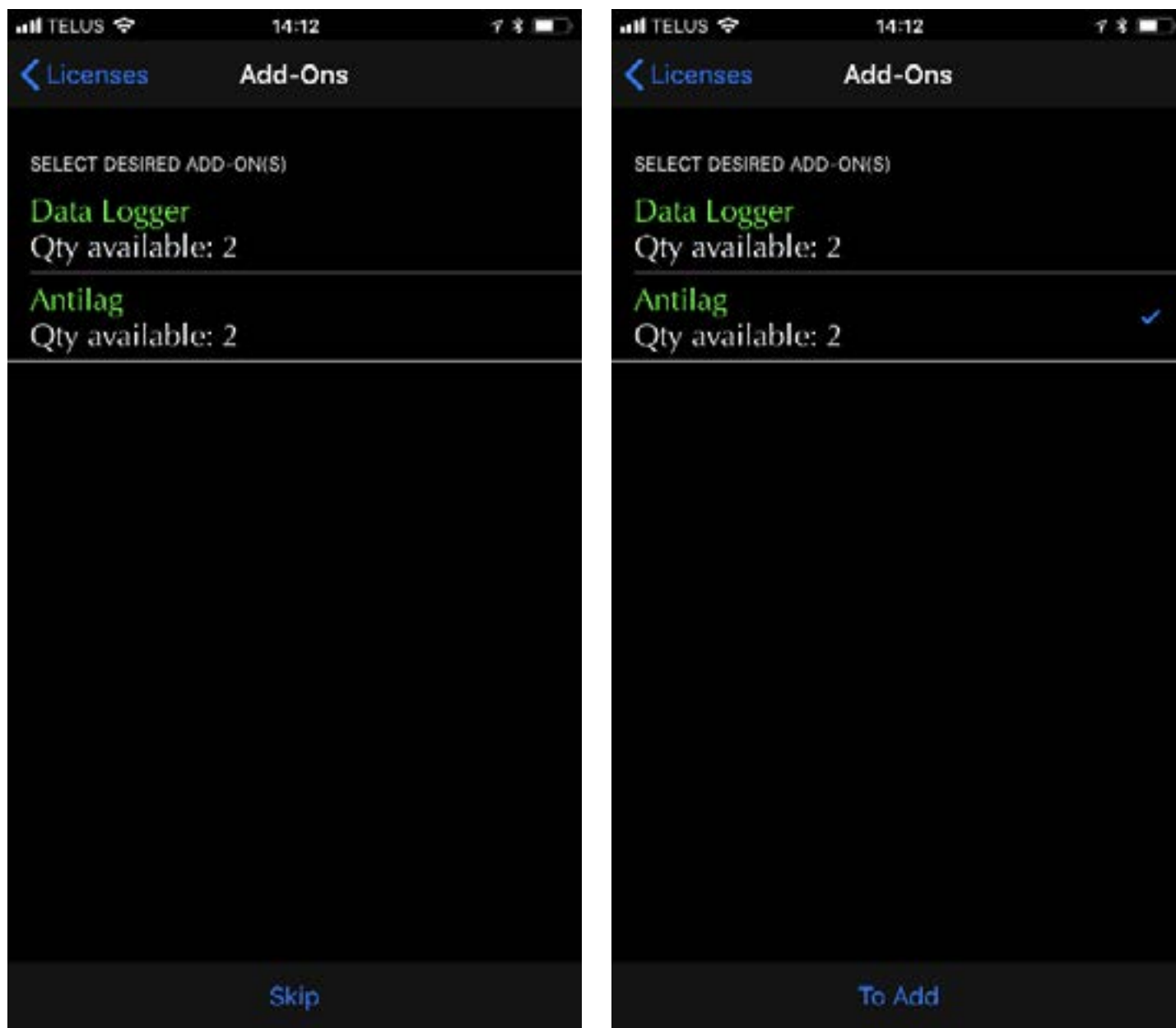


Figure 53. Licenses Add-Ons

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*.

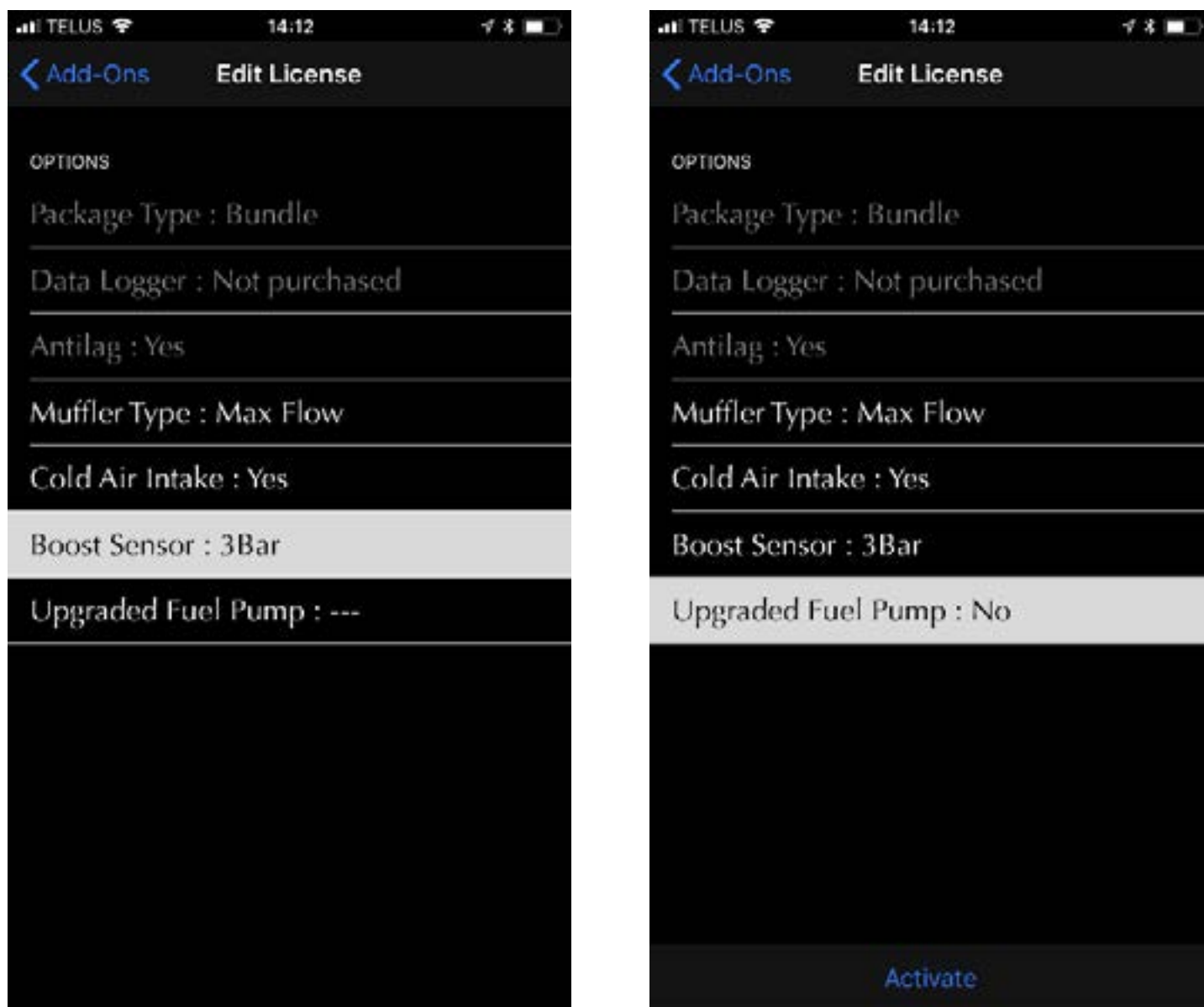


Figure 54. Licenses Vehicle Parameters

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

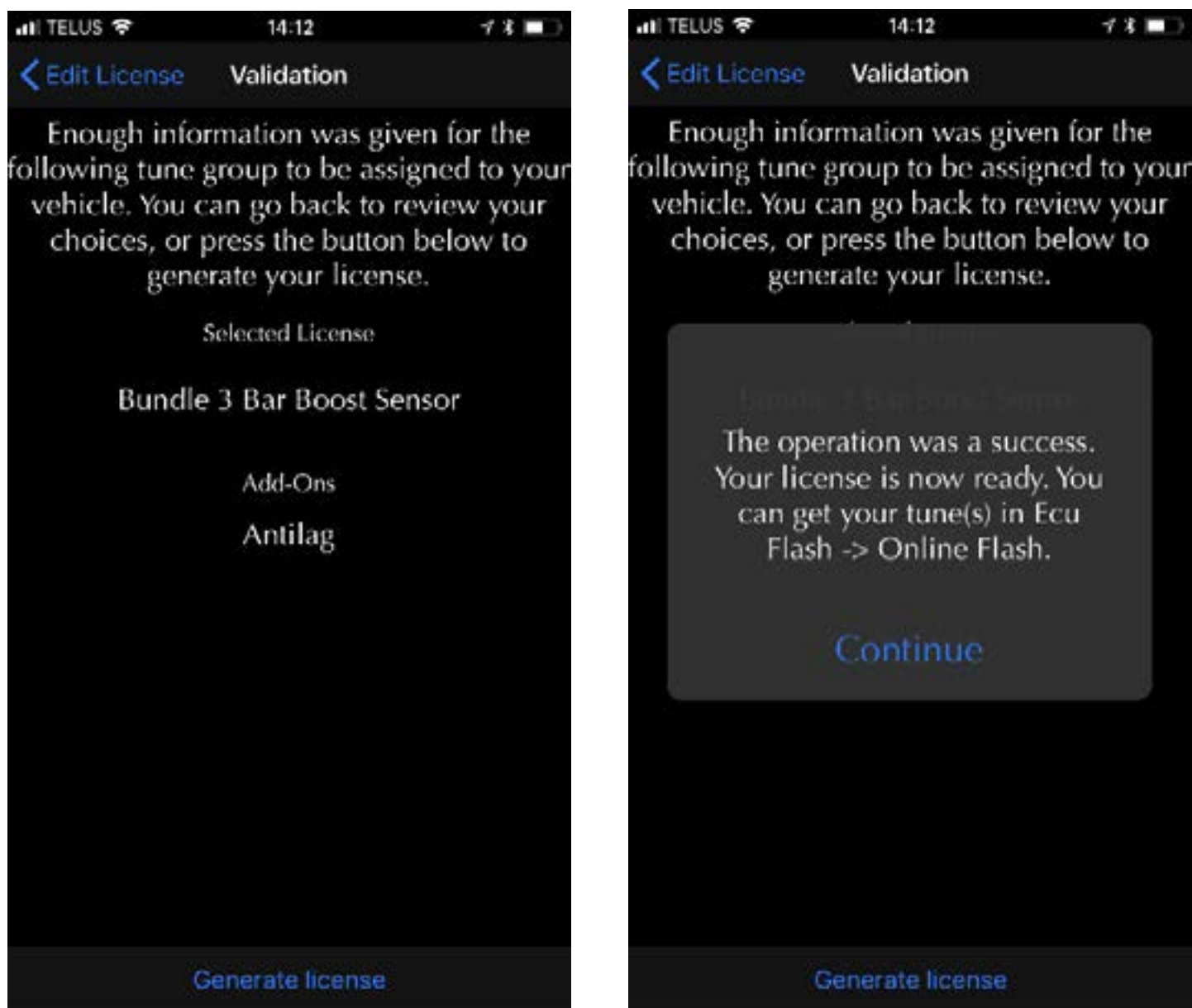


Figure 55. Generate the license

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 may not need to be contacted to proceed with License changes. Changing vehicle parameters fee is up to the tune provider.
- 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 Transfer” licence. This is used for transferring the high beam switch signal to the flasher instead of using a wiring harness when using this switch to activate Anti-Lag. This is also included in the Instrument Cluster Update 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 56. Anti-Lag licence example 1

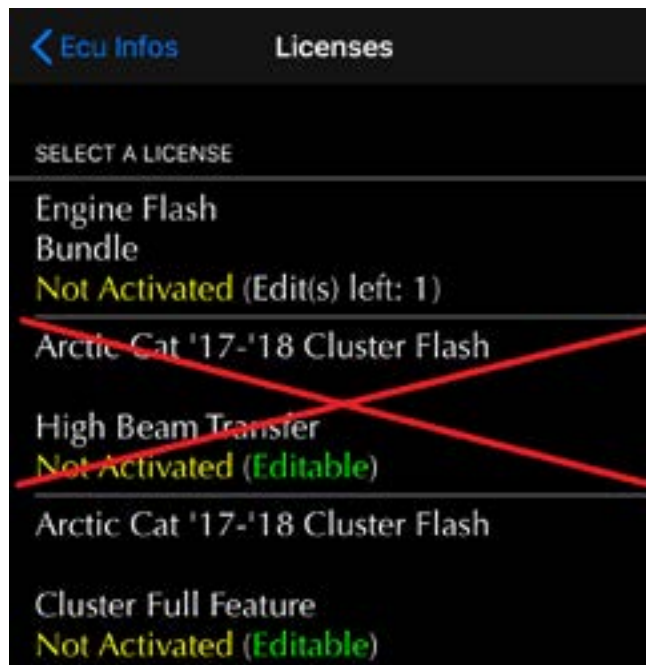


Figure 57. Anti-Lag licence example 2

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**)

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 will have to be used in order for the Anti-Lag to work. **The Anti-Lag activation using the high beam switch is already included in the Cluster Full Feature thus High Beam Transfer licence is not used.**

Upgrades

When an upgrade from a single tune to a Jukebox is purchased, it will be applied in this subsection.

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

For example:

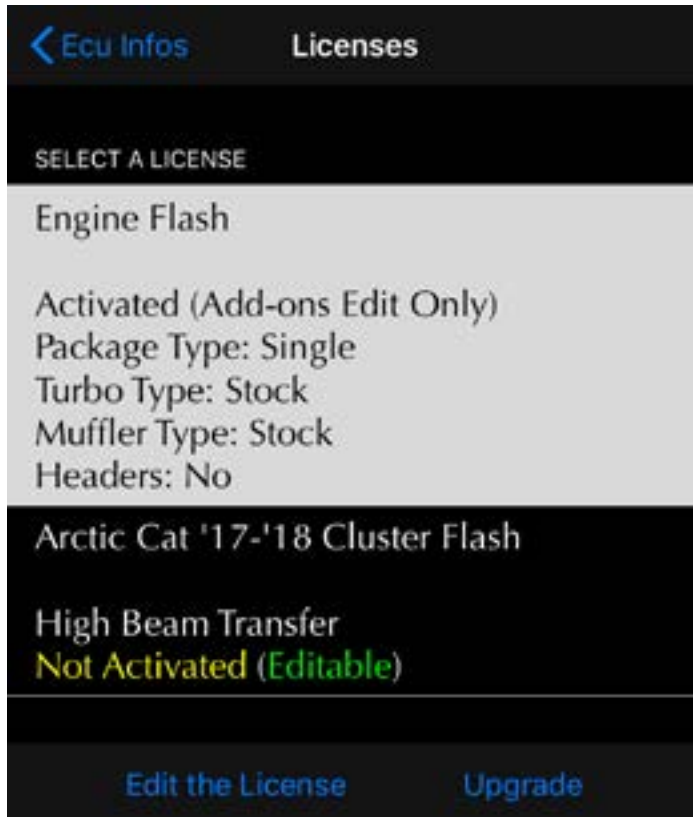


Figure 58. Upgrade example view # 1

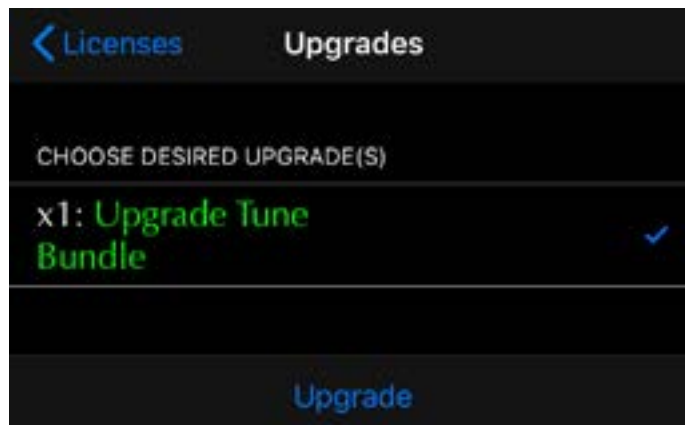


Figure 59. Upgrade example view # 2

Choose the upgrade and apply it by clicking on Upgrade.

Select the licence and click on Upgrade.

Finalizing

Once completed, navigate to the ECU Flash->Online Flash function to upgrade the ECU. **Note:** *Upgrading from an individual tune to a Jukebox (bundle) is done without intervention from the tune provider. Simply purchase the upgrade online and repeat the steps shown in [section 5](#)*

5 Steps to update ECUs, 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 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.



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

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	Purchase a Tune or Jukebox	section 5.1
	2 ^e	Use the license by filling the form located in the ECU Info function .	section 5.2
	3 rd	Updating the engine ECU	section 5.3
	4 th	Updating the instrument cluster* ECU	section 5.4
Applying Upgrades (single to bundle for example)			section 5.5

Table 9. Steps to update ECUs, modified mapping

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

5.1 Purchase a tune or Jukebox (bundle)

5.1.1 Introduction and Prerequisites

Tunes are available on the website of your mapping provider. One purchase is required per vehicle (VIN) and per ECU (engine, gauge). 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 2.5](#) or create an account and proceed with purchasing. The purchase will automatically be relayed to the GAP Flasher via the user account.

Note: *Upgrading from a product to another one (single tune to Jukebox bundle for example) is done without the intervention of the tuner.*

Prerequisites

Already a GAP Flasher owner: Having completed all steps found in [section 2.1](#).

Prior to purchasing or receiving your GAP Flasher:

- 1- Go to your Tuner's website and proceed with locating the Tune website link
- 2- Once on the GAP Innovation platform, https://gapinnovation.com/tuners_name.../, 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.

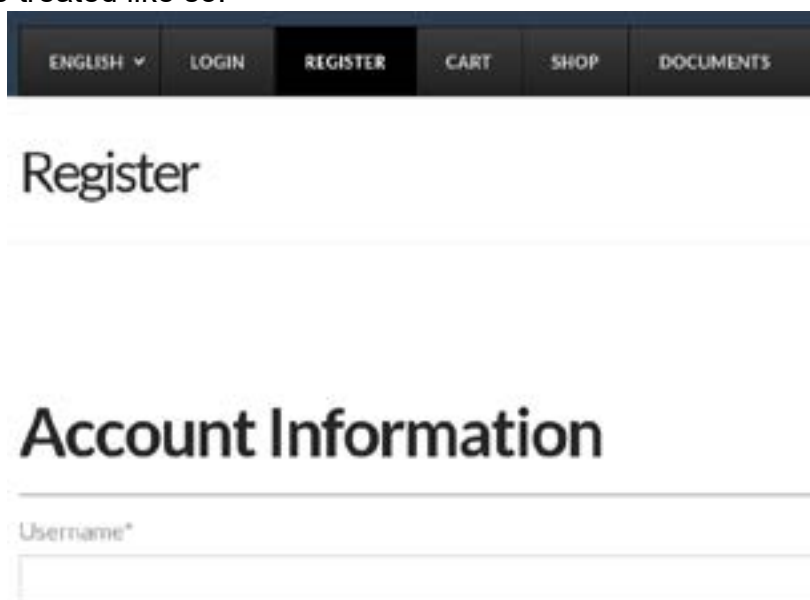


Figure 60. Website registering for purchasing prior to having a GAP Flasher

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

5.1.2 Steps, license purchasing

- 1- Go to your Tuner's website and proceed with locating the Tune website link
- 2- Once on the GAP Innovation platform, https://gapinnovation.com/tuners_name.../, click on «Login».
- 3- Click on Shop and Select the desired vehicle (VIN).
- 4- Purchase the required items. Once payment is made, a licence will be automatically created and made available to GAP Flashers linked to the account. Proceed with [section 5.2](#).

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. Simply repeat the steps found in this section.*
- *Multiple GAP Flashers can be linked to the same account thus licences will be available on each of them.*

5.2 Use the license located in the ECU Info function

This step allows the automated system to choose and apply the correct individual tune or Jukebox 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

Please see [Section 3.1.3](#) for more details.

5.3 Updating the engine ECU

Steps

- 1- Perform the initial stages of access
- 2- Select the “ECU Flash” function
- 3- Select “Online ECU Flash”

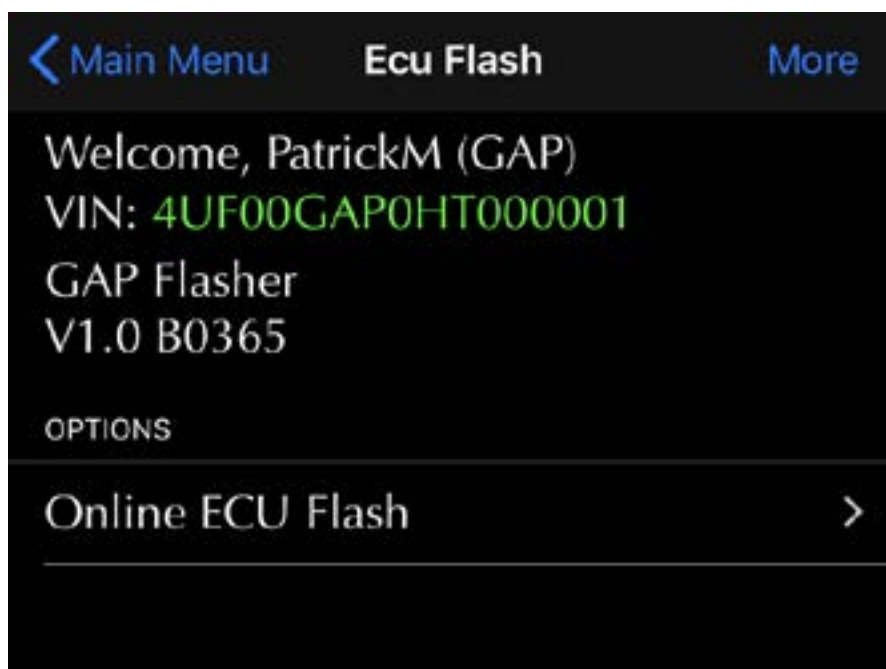


Figure 61. Tune Jukebox, covers and selection

- 4- Select the correct engine file

Note: 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.

- 5- Turn ignition off, disconnect the tool from the vehicle and start the engine

5.4 Updating the instrument cluster ECU

Steps

- 1- Perform the initial stages of access
- 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.



WARNING

If the vehicle is equipped with the optional wideband sensor module, it shall be disconnected prior to flashing the Instrument Cluster ECU. Failure to do so may prevent proper flashing and render the instrument cluster inoperative.

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.

5.5 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:

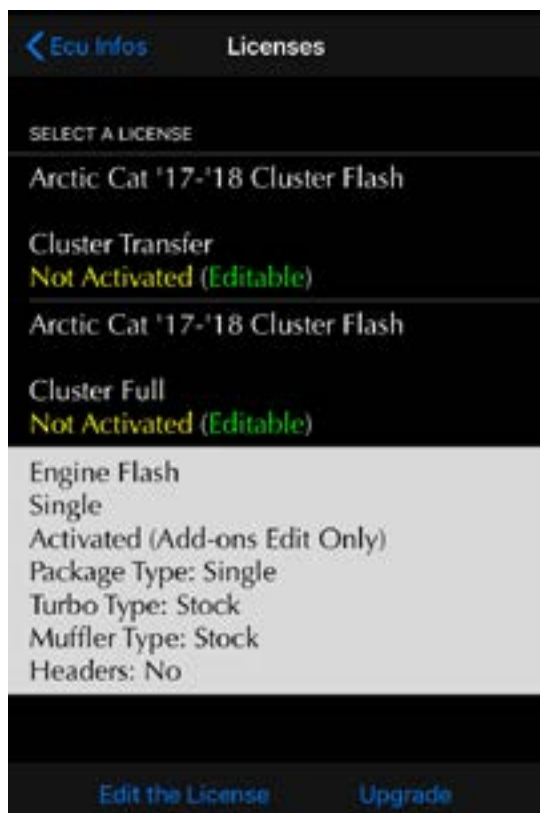


Figure 62. Upgrade example view # 1

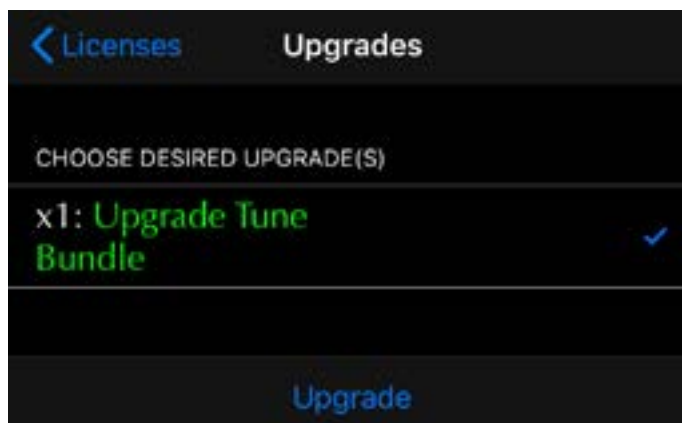


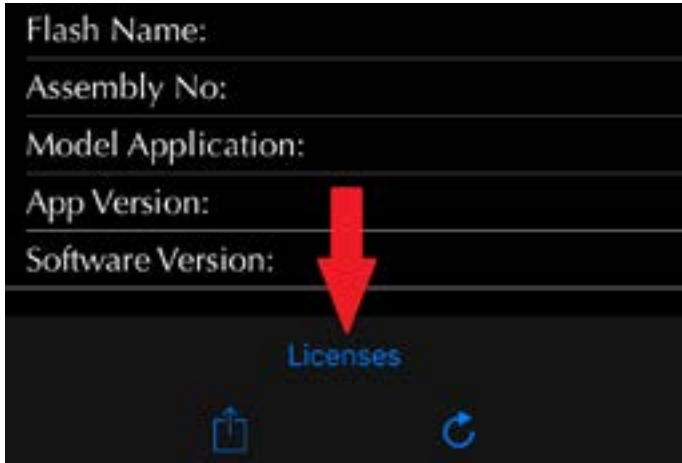
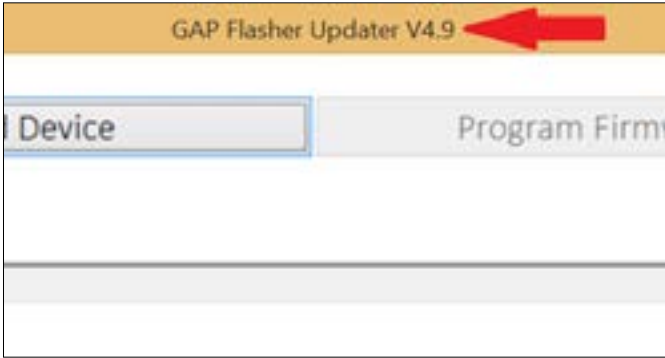
Figure 63. Upgrade example view # 2

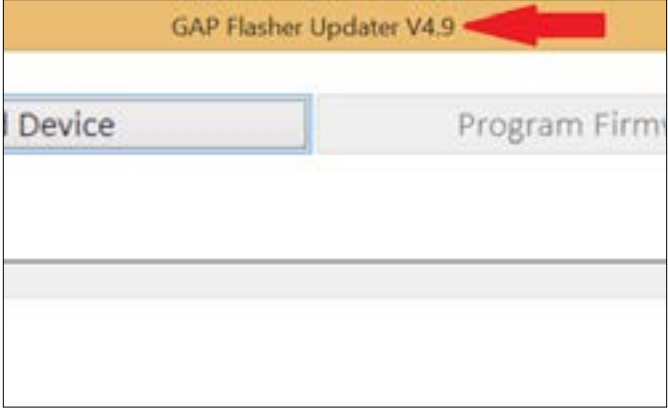
Choose the upgrade and apply it by clicking on Upgrade.

Select the licence and click on Upgrade.

Proceed with updating the ECU as per the previous page.

5.6 Troubleshooting flashing process

Symptom	Solution
Cannot log in. 	Make sure to have registered the GAP Flasher as per section 2.5
Licence button not visible in ECU Info, Outdated App. 	Update the mobile App found on the Apple Store or Google Play Store.
Outdated firmware message when trying to flash the ECU in ECU Flash--Online Flash 	Make sure you are using updater V4.9 or higher. If not, uninstall and install the updater software on the computer. Update the tool firmware to build 760 or higher using the updater software (program firmware button), section 2.4 

Symptom	Solution
System File is Missing message during the re-flash process 	Make sure you are using updater V4.9 or higher. 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 2.4 

6 Migrating to the licence system and transferring (coming soon)

7 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 7.1
	2 ^e	Update the GAP Flasher and mobile App synchronization.	section 7.2
	3 rd	Updating the engine and/or ClusterECU	section 7.3

Table 10. Steps to update the engine ECU, modified mapping

7.1 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. Please consult *Access and sending ECU Info* of [section 4.2](#), for additional details if required.

7.2 Updating the GAP Flasher with the modified file

Once the provider confirms that a custom 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.

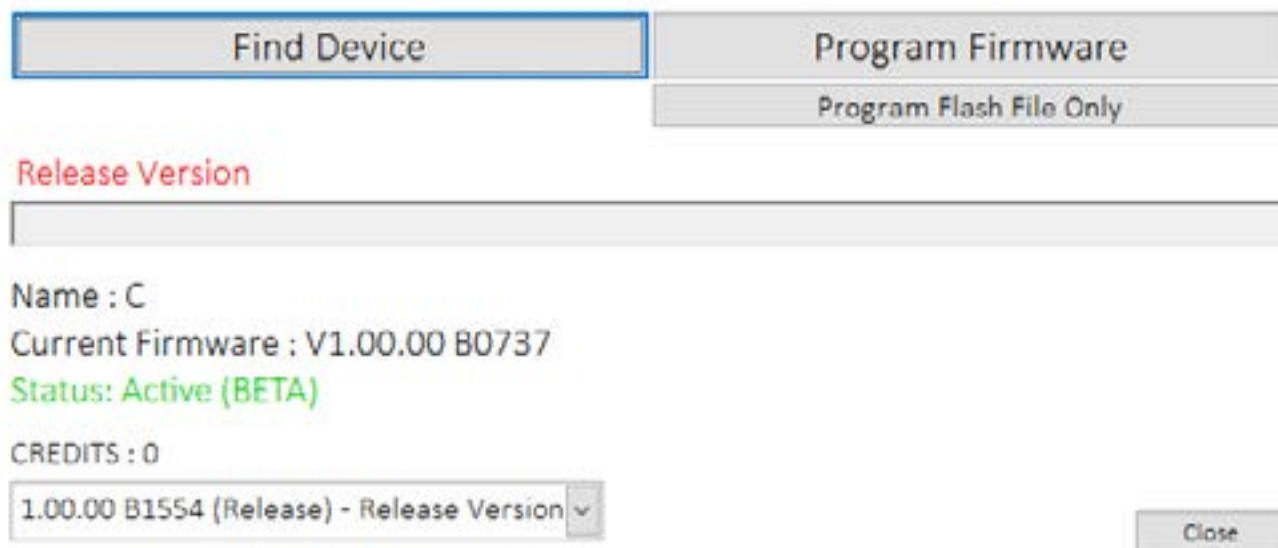


Figure 64. Updater software overview

7.3 Updating the engine and/or Cluster ECU

Connect the tool to the vehicle and proceed with using the ECU Flash function [section 4.3](#).

Disconnect the tool from the vehicle and start the engine. The Engine ECU is now updated.

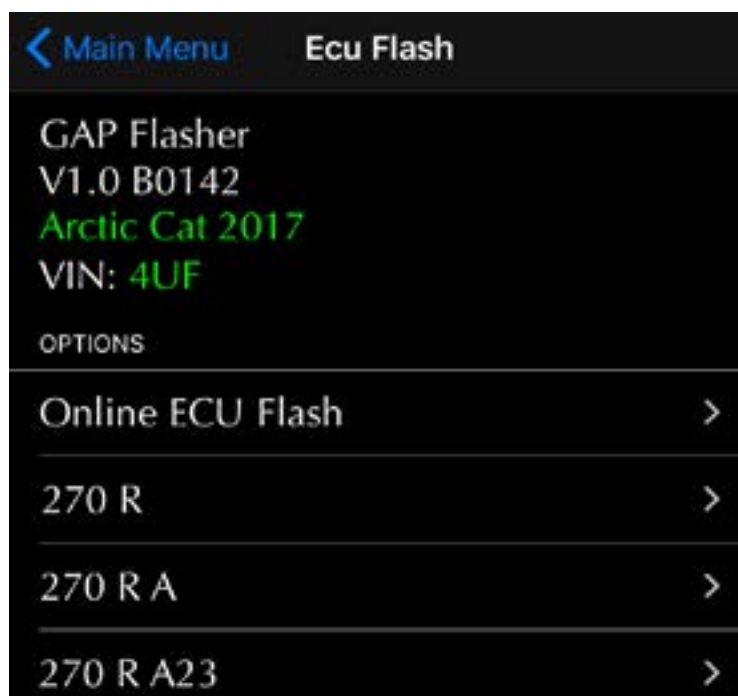


Figure 65. ECU Flash submenu

Limited Warranty

GAP Innovation warranties this product and accessories for one (1) year after the date of purchase with the exception of the AEM Wideband sensor which does not come with a warranty. The warranty covers only the GAP Flasher of the original purchaser (non-transferable) and accessories. It covers manufacturing and workmanship defects for the duration defined above. The warranty is limited to the functionality of the system and the system itself. It is the user's responsibility to use the GAP Flasher safely.

The user must return the GAP Flasher or accessory to GAP Innovation to have the warranty honoured. The user must provide a proof of purchase.

The warranty is void if:

- The product has been damaged or altered in any way
- The product is damaged by water, fire, accident or other condition beyond the control of GAP Innovation
- The product has been improperly installed or misused

The warranty does not cover:

- Shipping and handling.
- Taxes, duties or others perceived by customs.
- Any material damages other than the GAP Flasher itself or accessory.

Under no circumstances will GAP Innovation be liable whatsoever for incidental or consequential damages. The warranty is limited to the value of the product.

Contact:

GAP Innovation

support@GAPInnovation.com

Glossary

ECU : Electronic Control Unit. An ECU is an embedded system that controls one or more systems or subsystems present in a motor vehicle.

CAN : For Controller Area Network, is a communication protocol which connects ECU's via a two wires interface.

Vehicle control module software updates (Re-Flashing) : The action of programming an ECU firmware. The term flashing comes from the fact that microcontrollers used in ECU's are made with flash memory.

VIN : Vehicle Identification Number. It's a unique code which includes information about the vehicle's configuration and its serial number.

DTC : For Diagnostic Trouble Code or fault code.