FOUR STROKE
PERFORMANCE

ERM User Guide

KTM 4T Models

April 2025

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1. Product Overview

The FSP ECU Reflash Module (ERM) is a powerful handheld tuning and diagnostic tool packed full of features. The ERM works with the OEM ECU and allows you to perform the following functions:

- Save a copy of the Original Tune from the ECU
- Flash a copy of a FSP Tune to the ECU unlimited times
- Store up to two different FSP Tunes plus the Original Tune on the ERM at the same time
- Make simple but effective changes to the FSP Tune through **Basic Tuning**. This allows changes to fuel, ignition, throttle response and engine braking.
- Flash the Original or FSP Tune to the ECU in approximately 90 seconds.
- Make more advanced changes to tune using **Pro Mode** or **Pro+ Mode** (paid additional features)
- Read and clear fault codes
- View live engine data such as rpm, throttle, voltage, coolant temperature and map selection.

1.1 Quick Start Guide

Before starting the process of setting up and pairing your new ERM to a bike please make sure you watch the series of 'Getting Started' videos on Youtube. This playlist of videos guides you through all the steps required to setup a brand new ERM.

Click the link below to begin the first video in the series...

Getting Started 1 - Unboxing the ERM

We strongly advise that you watch the videos above in full, however a quick summary of the videos is as follows:

1. Power your ERM from a computer using the supplied USB cable
2. Note the device ID and verification number (Please note these must be 100% accurate or you will not gain access to the website)
3. Visit www.erm-performance.com
4. Create a customer account
5. Once your account is activated go to 'My Devices' and register your new device with the Device and Verification IDs noted down before. You will then be asked to put in your bike's information – Ensure you do this correctly as you will only have access to Tunes to suit your bike
6. Under 'My Devices', press 'Device Info' and then 'Download Registration File'. Save this file to your PC.

7. Under ‘My Devices’, press ‘Maps’ and download the relevant FSP Tune to your PC. Ensure you take your time to select the correct tune for your bike setup, as you are only allocated one free tune with your ERM.
8. Go to the ‘Software Downloads’ and download the latest version of the ERM Manager software.
9. Run ‘ERM Manager Setup’
10. Once the ERM Manager is open, press ‘Refresh’. Select your ERM when it appears on the list, and press ‘Connect’ and wait a moment.
11. After ERM manager has connected to your ERM, press the ‘Registration’ tab, and then press ‘Upload Registration’. Select the registration file that you previously downloaded from erm-performance.com and press OK. Your registration details should now appear on the Registration screen in the ERM Manager application.
12. Now go to the ‘Tunes’ tab, press ‘Upload Tune’, select the tune which was downloaded from the website earlier, press OK. The device will download the tune you’ve uploaded to ERM Manager and reboot. If successful, ERM Manager will reconnect automatically when it’s finished.
13. Your ERM is now registered with your tune and you are ready to plug it into your bike!
14. Fit the separate 4 stroke ERM adapter cable to the 6 pin diagnostic plug under the seat.
15. On the ERM itself you will see 4 different white plugs labelled 1 to 4 at the end of the cable. Connect plug #1 and #4 to the matching plugs on the adapter cable fitted to the bike in the previous step.
16. Once the device is powered, it will ask you to Pair to your ECU. This will take a copy of your stock ECU tune in this process. Important note: The ERM can only be used against one bike at a time, and it will lock to your ECU unless an unlock code is purchased
17. Before pairing the ERM requires an active internet connection. This is required to gain access to your ECU for the first time only. This can either be to your home wifi network, or to a mobile phone using wifi tethering.
18. After the device has finished pairing to your ECU, you are free to use the device! This is a good time to go into the options and flash the downloaded FSP Tune to your ECU.

2. Care Instructions

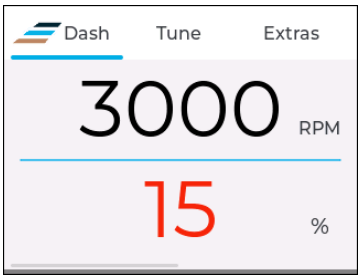
- **Do not** leave the ERM plugged in when not using your bike. The ERM will use a small amount of battery power while asleep and it may drain the battery after 1-2 weeks depending on battery condition. It is best to always disconnect after use.
- **Avoid** contact with water when possible. The ERM is rated IP54. This means that the ERM has moderate water resistance, but it is not waterproof. Water ingress may damage the ERM. Do not pressure wash. Do not submerge the ERM in water.
- When setting up your ERM, **always** save a backup of the original tune once the ERM has been paired; this will allow easier recovery of your stock tune in the future in case of ERM damage.
- When using the ERM on the bars, treat it like any other valuable electronics device; it can handle a small amount of moisture, vibration, and impact but it is not bulletproof. It is advised to use it as intended for tuning & data logging, but otherwise it is safer to keep it off the bars unless required.

- Warranty – For a full breakdown of the FSP warranty, please visit the warranty & legal sections. Water damage, impact damage and normal wear & tear are not covered under warranty.

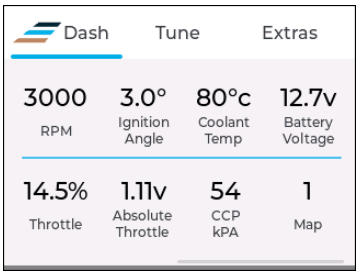
3. Dash Pages

3.1 Dash Overview

The Dash feature on the ERM gives you live data from your engine laid out in different formats. You can use the information on the dash screens to assist with tuning of the engine, performing service items such as setting TPS voltage, checking crank pressure sensor readings, checking battery or charging voltage, changing maps, or viewing coolant temperature. The Dash feature comprises two different screens, and each can be accessed by half-swiping across the screen from any other Dash screen.

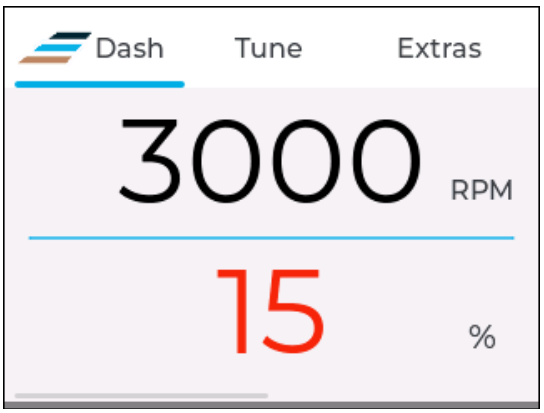


Dash One



Dash Two

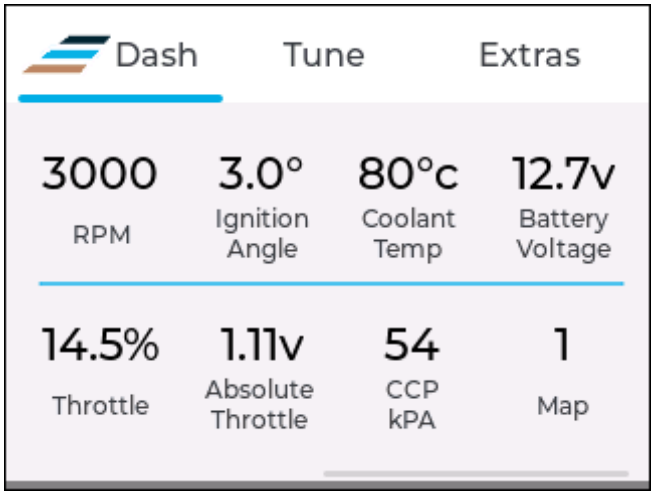
3.2 Dash One Screen



Dash One

To get to Dash One, press the Dash label at the top left corner of the ERM screen. This will take you to the Dash area and will display Dash One. This screen features large text and allows you to view RPM and throttle. It is intended for use while riding so that with a quick glance you can see the current state of the engine. This is particularly helpful when tuning the engine. For example, if there is an area where the engine feels rich you can make a quick check of RPM and throttle while riding and then use this info to make effective changes to that zone using our Tune feature. Knowing basic info about which throttle position and RPM the engine is operating at makes tuning much easier and quicker.

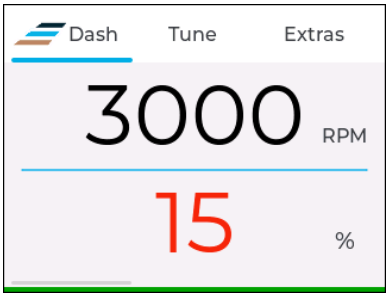
3.5 Dash Two Screen



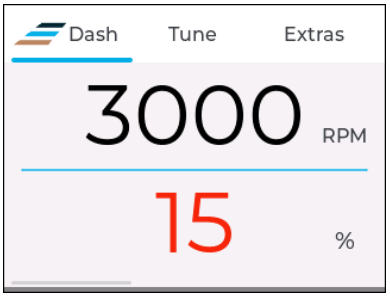
- **RPM:** Engine rpm
- **Ignition Angle:** Ignition advance angle in degrees
- **Coolant Temp:** Coolant temperature in degrees celsius or Fahrenheit
- **Battery Voltage:** With the engine off this shows the battery voltage, with the engine running it shows charging voltage.
- **Throttle:** Throttle from 0→100%. At idle it is normal for this value to be 1-2%.
- **Absolute Throttle:** TPS voltage from 0 → 4.45v
- **CCP:** Crankcase pressure reading in kPa
- **Map:** Selected map

3.6 Map Indicator Bar

All Dash screens feature a map indicator bar at the bottom of the screen. This bar changes from grey to green to indicate if the White map or Green map have been selected.



Green Map

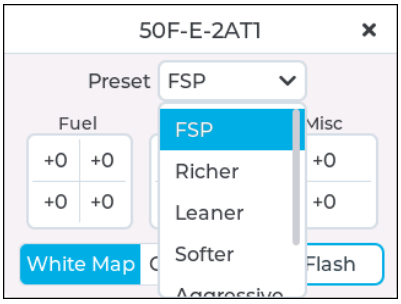


White Map

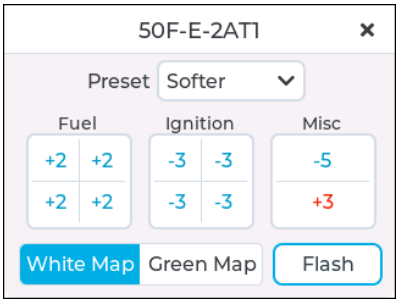
4. Tune Overview

The Tune section of the ERM is one of the most powerful features of this device. It allows you to flash a tune to the ECU (Original, FSP Tune 1 or FSP Tune 2) in as little as 90 seconds plus allows you to modify either of the stored FSP Tunes to suit your riding style and conditions. When modifying a tune you have a choice of three different modes - **Basic, Pro and Pro+**.

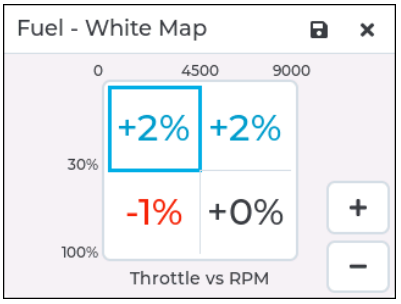
Basic Mode comes free with every ERM and allows the user to make simple but effective changes to the mapping based on rpm and throttle. It offers four cells of adjustment based on low/high throttle and low/high revs.



Preset Options

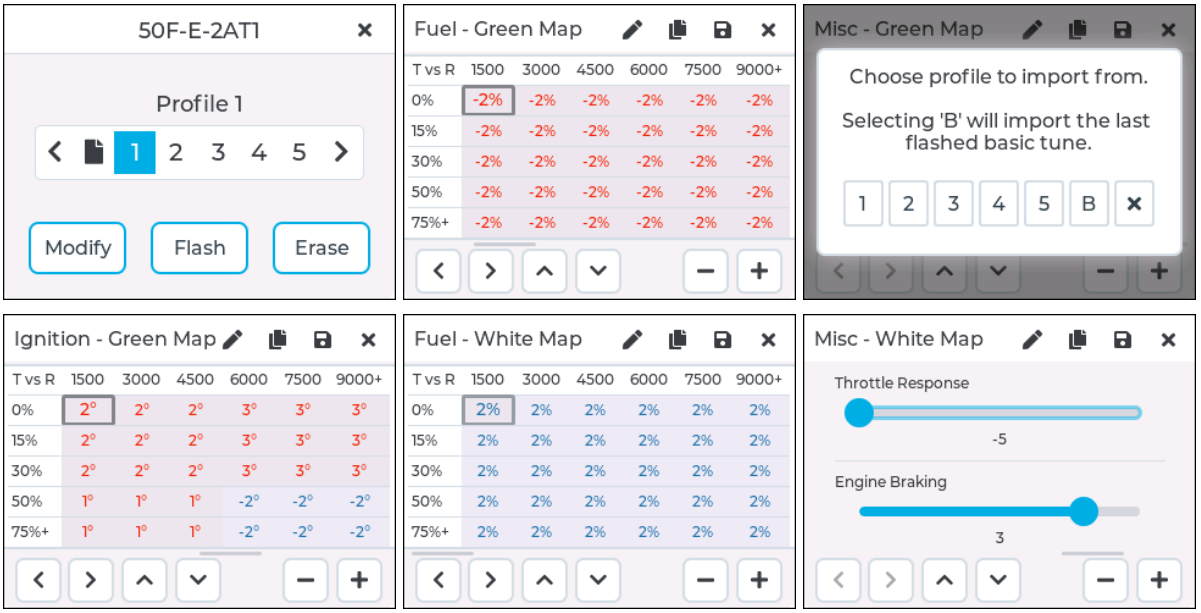


Softer Preset



Fuel Table Customised

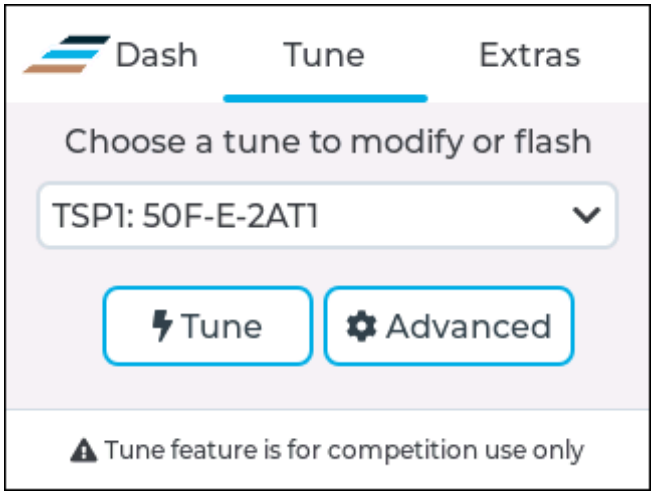
Pro Mode is a paid extra and allows the user to make changes based on rpm vs throttle to a much higher resolution than Basic Tuning. It offers 30 cells of adjustments across multiple rom and throttle points. Pro mode is limited by min/max adjustment values for fuel and ignition and is suitable for most novice through to experienced users.



Pro+ Mode is a paid extra and offers the same resolution as Pro Mode (30 cells) but has no limitations on the size of the changes. Pro+ Mode is intended for experienced users only.

4.1 Navigating to the Tune section

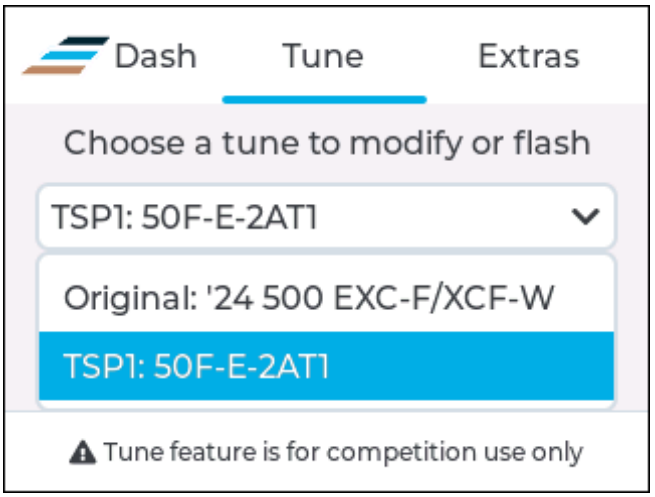
To get to the Tune feature press the 'Tune' label centre-top of any ERM screen. This will take you to the first Tune screen which shows a drop down menu of all the available maps (see below).



4.2 Tunes

The ERM is capable of storing up to three different tunes that can be used unlimited times on the ECU that the ERM is paired to. The ERM comes with one free FSP Tune but others can be purchased and downloaded from the ERM website then saved to the ERM.

The dropdown menu on the first Tune screen shows the tunes available on the ERM to flash or modify:



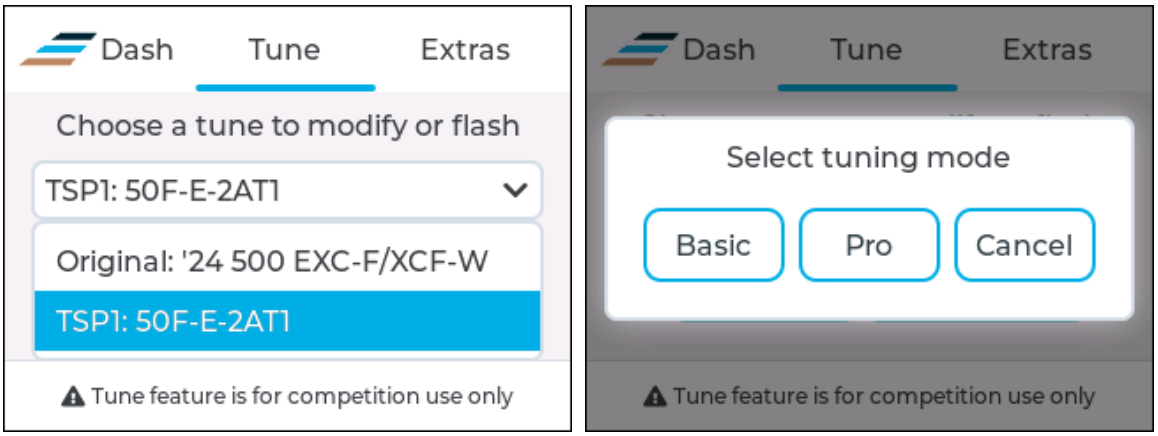
Original: This is the original tune that was copied from the ECU during ERM pairing. It is assumed that this will be the stock factory tune for your bike, however if the ECU has previously been tuned it may already be a modified tune. The ERM will treat any tune that is on the ECU during pairing and the 'Original Tune'. The tune saved as the Original Tune can be flashed back to the ECU at any time but it cannot be modified.

The Original Tune is automatically given a name based on the bike details used during registration of the ERM. Eg. '24 500 EXC-F/XCF-W

FSP1 & FSP2: These are the FSP Tunes loaded using ERM Manager. You may not have a FSP2 option if you have not loaded a second tune. FSP tunes can be flashed to the ECU or modified using Basic, Pro or Pro+ Modes. There are no limits on the number of times they can be flashed or modified. The name shown on the dropdown menu is the name given by FSP for that particular tune. Eg. 50F-E-2AT1

4.3 Selecting a Tune to Flash or Modify

Choose a tune from the dropdown menu, then press **Tune**. You will then be given a choice of **Basic**, **Pro** or **Cancel**.



Note: Changes cannot be made to your original tune

Basic: Takes you to the Basic Tuning section where you can flash a FSP Tune to the ECU. You can also use this feature to make quick and effective changes to a FSP Tune to suit individual riding conditions or bike setup. It offers 4 cells of adjustment based on low/high throttle and low/high revs.

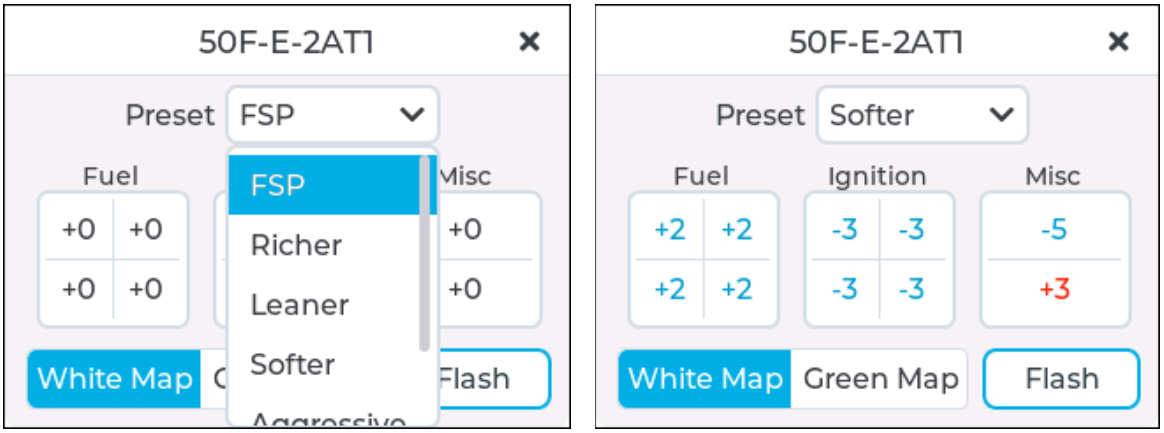
Pro: Takes you to Pro Mode where you can make higher resolution changes than Basic allows. Pro Mode is a paid feature which can be activated on the ERM website. It offers 30 cells of adjustments across multiple rpm and throttle points. Pro mode is limited by min/max adjustment values for fuel, ignition, power valve and oil.

Cancel: Takes you back to the tune selection dropdown menu

5. Basic Tuning Overview

Basic Tuning is an extremely powerful yet simple feature which allows the user to modify fuel, ignition, engine braking and throttle response on either of the FSP Tunes stored on the ERM. Basic Tuning is available to all ERM users with no additional cost. It is intended to allow users to make simple but highly effective changes to the FSP Tunes to suit individual riding conditions, fuels or bike setups.

To reach the Basic Tuning feature select a tune from the dropdown menu and press **Basic**. This will open the main **Basic Tuning** screen:



5.1 Basic Tuning Tables

Basic Tuning features 2×2 tables for fuel, ignition, and two sliders for engine braking and throttle response. These tables can be quickly and easily adjusted using one of the available presets, or create custom tune changes by adjusting the individual values.

5.1.1 Fuel Table

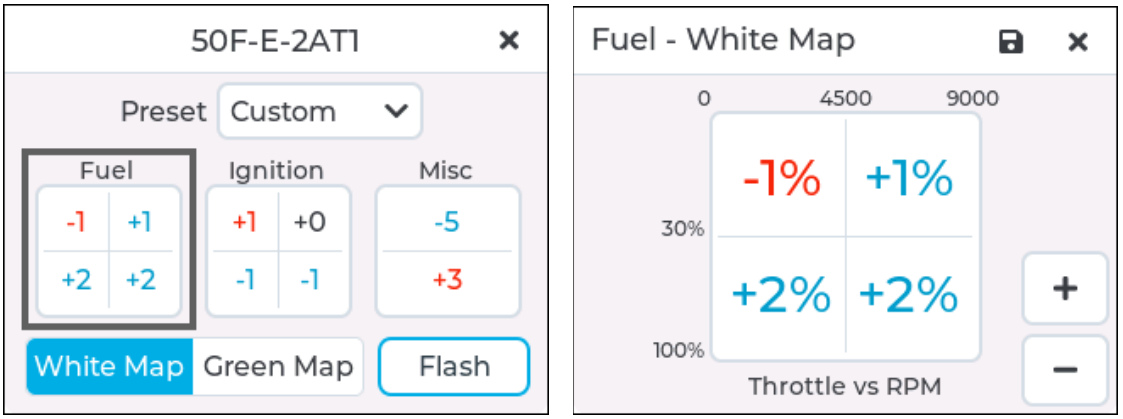
The fuel table shows an overview of the changes that will be made to the fuel map if it is flashed to the ECU. The rpm and throttle axis labels have been left off from this view to simplify the screen. In order to adjust these settings or view the axis data press anywhere on the table and you will be taken to an enlarged version of the table which allows changes to the individual values.

Fuel values can be changed from -10% to +10%. Negative values appear in red (possible risk) and will reduce fuel to the engine, making it leaner. Positive values will appear in blue (usually safe) and will increase fuel to the engine, making it richer.

BEWARE: Reducing fuel always has some risk. The FSP Tunes are already highly developed and should not require large changes. If an engine is too rich to begin with, reducing fuel up to a point will make more power and make the engine smoother and better to ride. Reducing fuel further beyond this point may make the engine lean and increase the risk of flame-outs and

engine damage. A lean engine will generate more heat and may be at risk of failure. When reducing fuel, only make small changes of -1% to -2% at a time, then test before making larger changes.

IMPACT OF % CHANGES: Changes to the fuel map in % will increase or decrease the fuel amount set in the FSP Tunes by that percentage. For example a value of -5% entered in a cell will result in the new fuel amount being 95% of the current fuel amount at that rpm/throttle point. Likewise a value of +10% will result in a new fuel amount of 110% of the current fuel amount.



5.1.2 Ignition Table

The Ignition table shows an overview of the changes that will be made to the ignition map if it is flashed to the ECU. The rpm and throttle axis labels have been left off from this view to simplify the screen. In order to adjust these settings or view the axis data press anywhere on the ignition table table and you will be taken to an enlarged version of the table which allows changes to the individual values.

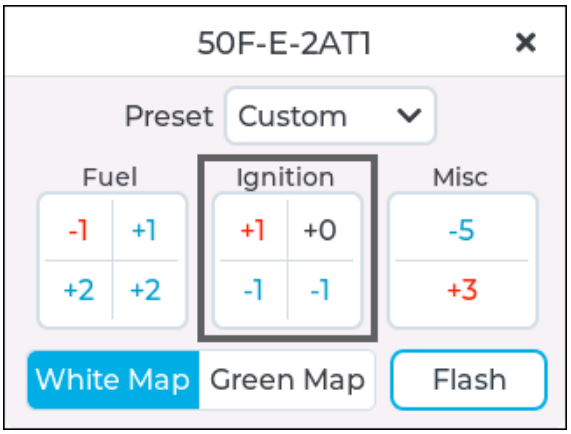
Ignition values can be changed from -5 degrees to +3 degrees. Negative values appear in blue (usually safe) and will reduce ignition advance to the engine, usually making power delivery softer. Positive values will appear in red (possible risk) and will increase ignition advance to the engine, usually making power delivery more aggressive.

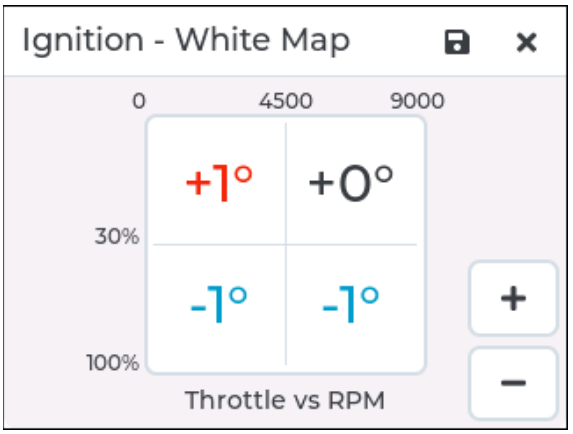
BEWARE: adding ignition advance always has some risk. The FSP Tunes are already highly developed and should not require large changes. If an engine has a soft ignition setting to begin with, adding more advance up to a point will make more power and the bike will feel better/stronger to ride. Adding more ignition advance beyond this point usually won't add any more power but may increase the risk of engine damage. An engine with too much ignition advance will generate more heat and will have a higher risk of detonation, especially when under load. When adding ignition advance, only make small changes of +1 degree at a time, then test before making larger changes.

IMPACT OF CHANGES: Changes to the ignition tables are a straightforward addition or subtraction to the underlying values in the FSP Tune. You can check the current ignition

advance at any time on the Dash screens. Ignition advance is expressed in degrees of crank rotation before top dead centre.

If a value is entered in one of the 2x2 table cells it will simply increase or decrease the current underlying value in the FSP Tune. For example, if -3 is entered into one of the cells the ECU will give 3 degrees less ignition advance. That is, if the current ignition advance was 20 degrees before top dead centre the new advance value will be 17 degrees before top dead centre.





5.1.3 Misc Table

The Misc table (short for Miscellaneous) contains the Throttle Response and Engine Braking sliders. These are 2 of the most powerful features of the 4 stroke ERM.

THROTTLE RESPONSE SLIDER
The genuine KTM Group 4 stroke ECU adds or subtracts ignition advance for a very short period of time as the throttle is being opened in order to change the 'feel' of the power delivery. If ignition is added during this moment the engine will feel more aggressive, accelerating faster and breaking traction more easily. If ignition is subtracted during this moment the engine will feel softer, accelerating slower and maintaining traction in slippery conditions more easily. Once the throttle position stabilises and is held constant the ECU will return the ignition value to 'normal' as determined by the base ignition table. As a result 2 different tunes could have exactly the same power and torque at constant throttle, but feel very different under acceleration. Having control over this gives the user the ability to make drastic changes to the 'feel' of their engine without actually changing overall power and torque at constant throttle.
Every stock tune uses this strategy but unfortunately its not always well implemented and often causes a 'jerky' feeling that some riders complain about at low revs and low throttle.

By adjusting the Throttle Response slider on the ERM the user has control over how much ignition is added or subtracted in the moment the throttle is opened. The resulting difference to engine 'feel' is very significant!

- Moving the slider to the **left** (negative number) will reduce ignition in the moment the throttle is opened, giving a softer feeling to the power delivery.

- Moving the slider to the **right** (positive number) will increase ignition in the moment the throttle is opened, giving a more aggressive feeling to the power delivery.

BEWARE: Any time ignition is increased there is potential for risk. Although our FSP tunes are highly developed there may be some instances due to engine wear, local weather, fuel or riding conditions where increasing Throttle Response creates an audible knock under hard acceleration. If this occurs simply move the Throttle Response slider back to the left and investigate the underlying cause. Often adding fuel or reducing ignition advance using the 2x2 Basic Tuning Fuel and Ignition tables will be enough to resolve an engine knock without having a noticeable impact on performance.

NOTE: the strategy the ERM uses to adjust Throttle Response is very different to the strategy used by the genuine KTM Connectivity Unit. The ERM strategy has much higher resolution, taking into account far more rpm/throttle positions and overall it is much more effective and changes the feel of an engine.

ENGINE BRAKING SLIDER

By adjusting the amount of ignition advance at mid/high revs when the throttle is closed we can make a significant change to the level of engine braking felt by a rider. Increasing ignition advance when the throttle is closed at high revs will increase the sensation of engine braking. Decreasing ignition advance when the throttle is closed at high revs will decrease the sensation of engine braking.

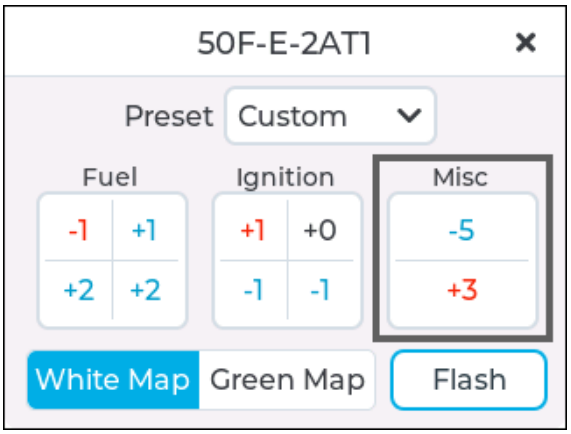
By adjusting the Engine Braking slider on the ERM the user has control over how much ignition is added or subtracted in the moment the throttle is closed at mid/high revs. The resulting difference to engine braking is significant.

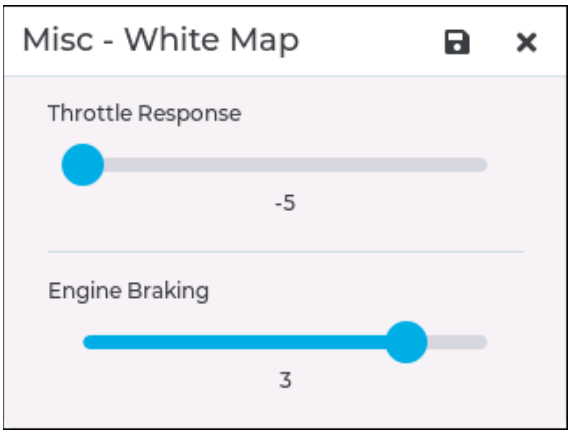
- Moving the slider to the **left** (negative number) will reduce ignition in the moment the throttle is closed, reducing engine braking.

- Moving the slider to the **right** (positive number) will increase ignition in the moment the throttle is closed, increasing engine braking.

NOTE: FSP tunes already have changes made to engine braking compared to stock. We generally release our tunes with less engine braking than the stock tunes as it gives a smoother feel to the overall ride. The Engine Braking slider allows the user to make further adjustments to dial in the feel they prefer.
The strategy used by the ERM to adjust Engine Braking is different to the strategy used by the genuine KTM Connectivity Unit. The ERM strategy has much higher resolution, taking into

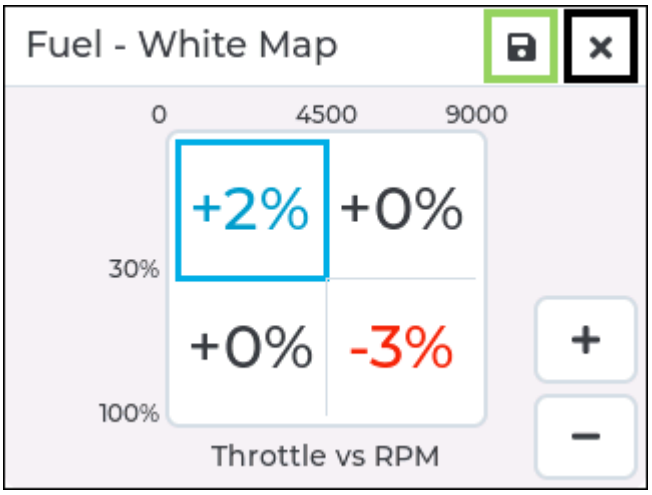
account far more rpm/throttle positions and overall it is more effective in changing the feel of the engine.





5.2 Changing Table Values

In order to change the values of a particular table, first select either White Map or Green Map in the bottom left corner, then press anywhere on the table you wish to modify. This will open a larger version of the table which allows the four individual cells to be modified. In order to change the values press on one of the four cells. The chosen cell will become highlighted with a blue border. Press the + or – buttons to increase or decrease the value in the selected cell.



- Red numbers indicate that the change may involve possible risk
- Blue numbers indicate that the change is usually safe.
- Black is used whenever 0% is chosen. This indicates that no change will be made to the cell, that is the values in that area will be the same as the values in the FSP Tune that has been selected.
- To save the values shown in the table, press the floppy disk icon at the top right corner of the screen.
- To cancel any changes and close the window press the cross icon at the top right corner of the screen.

5.3 Presets

The Preset dropdown menu allows you to select from several preset map adjustments. These presets are a great way to learn and feel how making changes to the map influences the performance of the engine… Richer, Leaner or Softer will all make a noticeable change to the performance of the engine and often guide the user in the direction they should proceed if they are unsure what their engine needs.

In most cases the FSP Tune will be the most powerful and smoothest option, however you can make further changes using one of the presets, or create your own custom tune by adjusting the values in the 2×2 tables as explained in section 3.5

Presets include:

- **FSP:** This has all cell values set to 0% and so it makes no change to the FSP Tune. Use this preset and press Flash if you just want to use the FSP Tune without further changes.
- **Richer:** This preset adds fuel everywhere. Best suited to bikes running in deep sand or used as a guide to determine the effectiveness of adding fuel before creating your own custom changes.
- **Leaner:** This preset reduces fuel everywhere and can be used for bikes that are running too rich with the standard FSP tune. It can also be used as a guide to determine the effectiveness of reducing fuel before creating your own custom changes.

BEWARE: Reducing fuel always has some risk. A lean engine can be at higher risk of damage. Always make small changes and test before making bigger changes.

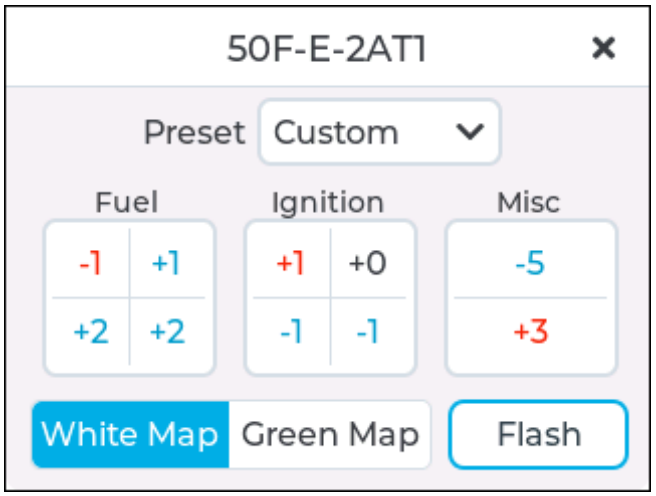
- **Softer**: this preset adds fuel, reduces ignition advance and reduces throttle response, and increases engine braking, all of which will reduce power and soften the tune. Use this preset to soften an aggressive tune to your liking. It can also be used as a guide to determine the effectiveness of the changes before creating your own custom changes.
- **Aggressive:** increases throttle response and decreases engine braking for a more aggressive, playful feel to the engine. The user can add their own fuel and ignition changes if necessary. NOTE: if increasing throttle response results in an engine knock under acceleration then reduce the slider value until the knock disappears, or add additional fuel.
- **Custom**: this can be setup with any changes the user likes. Any time another preset is selected and then cells altered those changes will automatically be moved to the Custom setting.

5.4 Map Selection

Every FSP 'Tune' contains two 'Maps' with one map being more aggressive and the other map being softer. Every time you flash an FSP tune to the ECU you are always flashing both maps.

- TPI bikes name the maps 'Map 1' and 'Map 2'
- TBI and 4 strokes name the maps 'Green' and 'White'

The map selector in the bottom left corner of the Basic Tuning screen allows the user to select the changes they want for either map in the Tune. The chosen map is highlighted in blue, like the example below where the White Map has been selected and a custom preset created.



Basic Tuning allows you to make different changes to each map. The preset selected under White Map can be different to the preset selected under Green Map. As a result it's possible to make completely different changes to either map within the same tune. One map could be made richer, the other leaner if necessary and when the Tune is flashed to the ECU the changes made to either map will be flashed to the ECU at the same time.

Tip: Pressing the Flash button will always flash the full tune with both maps

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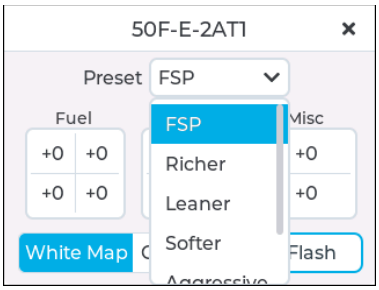
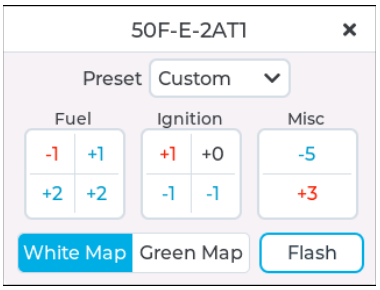
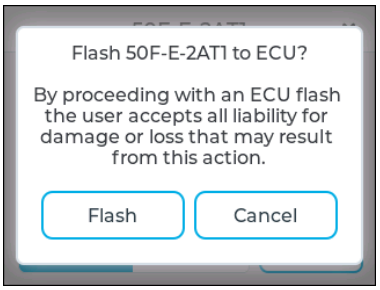
5.5 Flashing a FSP Tune to the ECU using Basic Tuning

The full process for flashing a FSP Tuned Map to the ECU is as follows:

1. Select the **FSP Tune** from the Tune page dropdown menu
2. Select **Basic**
3. Press **White Map**
4. Select the changes you wish to make to this map using the available presets, or create a custom preset. If no changes are required select FSP as the preset
5. Press **Green Map**
6. Select the changes you wish to make to this map using the available presets, or create a custom preset. If no changes are required select FSP as the preset
7. Press **Flash.** This will always flash both white and green maps even if only one has been modified,
8. Accept the warnings and proceed with flashing the ECU


50F-E-2AT1
Preset
FSP
Fuel
Misc
+0 +0
+0 +0
+0
+0
FSP
Richer
Leaner
Softer
White Map
Flash


50F-E-2AT1
Preset
Custom
Fuel
Ignition
Misc
-1 +1
+2 +2
+1 +0
-1 -1
-5
+3
White Map
Green Map
Flash


Flash 50F-E-2AT1 to ECU?
By proceeding with an ECU flash the user accepts all liability for damage or loss that may result from this action.
Flash
Cancel

6. Pro/Pro+ Mode

Pro and Pro+ Mode are powerful paid extras and allow the user to make changes based on rpm vs throttle to a much higher resolution than **Basic Tuning**. They offer 30 cells of adjustment across multiple rpm and throttle points for fuel and ignition, plus powerful sliders for Throttle Response and Engine Braking.

Both Pro and Pro+ allow the user to save multiple sets of changes in 'Profiles'. There are five Profiles for each FSP Tune, with each Profile storing a full set of changes for fuel, ignition, throttle response and engine braking for both Map 1 and Map 2 (or White/Green). Profiles can be backed up and are specific to the FSP Tune they are created with.

6.1 Pro Limitations

Pro mode is limited by min/max adjustment values within the ERM for fuel, ignition, throttle response and engine braking . It can be used by novice through to experienced users to make significant changes to the performance of an engine. **Pro Mode** limitations are:

- Fuel: -10% to +10
- Ignition: -5 degrees to + 3 degrees
- Throttle Response & Engine Braking: -5 to +5

6.2 Pro+ Limitations

Pro+ Mode allows unlimited adjustment to fuel and ignition and is designed for very experienced users making large changes to highly modified bikes. Pro+ Mode limitations are:

- Fuel: -100% to +100%
- Ignition: -100 degrees to +100 degrees
- Throttle Response & Engine Braking: -5 to +5

6.3 Activating Pro/Pro+ Mode

Any user can enter Pro mode and explore the user interface and experiment with modifying profiles, however only users who have paid to activate Pro or Pro+ can actually flash a modified map to the ECU using Pro Mode. In order to activate Pro Mode you will need to do the following:

1. Login to your account on the ERM website (www.erm-performance.com)
2. Go to **My Devices**

3. Press the Additional Features button next to the device you want to activate

4. Beside **Pro Mode** or **Pro+ Mode** press **Purchase**
5. Enter your payment details
6. Go back to **My Devices**
7. Press **Device Info** next to the device you want to activate
8. Press **Download Registration File** at the bottom of the page. Remember where the file is saved to.
9. Run **ERM Manager** on your PC or Mac (always check the ERM website to make sure you are using the latest version) See section 8.0 for more info on ERM Manager
10. Connect to the ERM.
11. Press the **Registration** tab on the left side
12. Press **Upload Registration**
13. Select the Registration File you saved in step 8 and press OK
14. Once the new registration file has been uploaded to the ERM you should now be able to use the full functions of Pro/Pro+

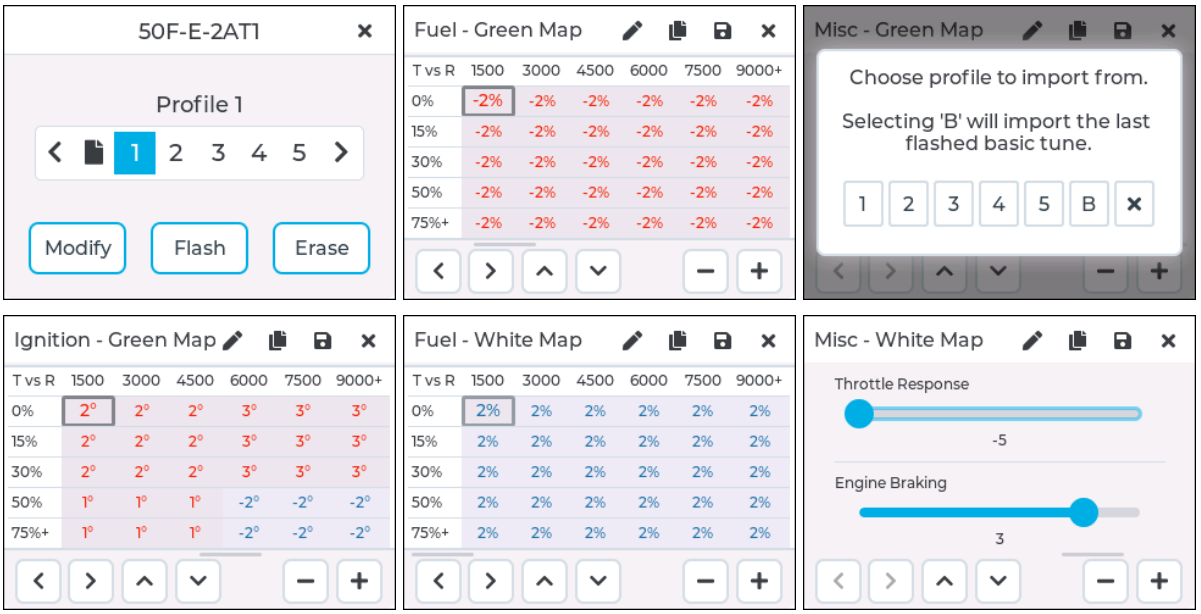
6.4 Profiles

In Pro mode a Profile is a set of changes to fuel, ignition, throttle response and engine braking that can be overlaid onto one of the FSP Tunes and then flashed to the ECU. In total there are five Profiles available for each FSP Tune, allowing the user to save different tunes for different conditions.

Each Profile can be individually named and Profiles can be imported from one another allowing easy development of new tunes. For example, the user may have developed a good tune using Profile 1 but may wish to experiment with more changes. Rather than modify Profile 1 further and risk losing a good tune, they can open Profile 2, import Profile 1 into Profile 2 and then continue making changes in Profile 2. This process can continue in Profiles 1-5 until the tune has been fully developed with the user knowing that they can always go back to the previous best tune without the risk of losing a good tune due to bad changes.

Alternatively each Profile can be named and used for different track or riding conditions. Eg Sand Track, Hard Enduro, Soft Map, Ethanol fuel, etc. Each Profile allows the following adjustments:

- Fuel White Map: 30 cells of rpm vs throttle, limits set by Pro/Pro+
- Fuel Green Map: 30 cells of rpm vs throttle, limits set by Pro/Pro+
- Ignition White Map: 30 cells of rpm vs throttle, limits set by Pro/Pro+
- Ignition Green Map: 30 cells of rpm vs throttle, limits set by Pro/Pro+
- Misc White Map: -5 to +5 Throttle Response & Engine Braking sliders
- Misc Green Map: -5 to +5 Throttle Response & Engine Braking sliders



6.4.1 Profile Selection Screen

After selecting a map from the Tune dropdown menu, then pressing Pro you will be taken to the Profile Selection Screen.

The tune name you have chosen is displayed at the top of the screen. In the example below one of the FSP Tuned Maps called 50F-E-2AT1 was selected from the Tune dropdown menu in the earlier step.

The selector in the centre of the screen allows you to choose either ‘Unmodified’ (indicated by the blank page icon) or Profiles 1 through to 5. The choice here determines what actions the 3 buttons at the bottom of the screen will perform:

Flash: pressing the **Flash** button will flash the selected tune (FSP or Original) to the ECU with the selected profile overlaid.

- If the 'Unmodified' blank page icon is selected it will flash a copy of the selected tune with no changes made.
- If one of the profile numbers 1-5 is selected then it will flash a copy of the map with the profile changes saved to that profile overlaid onto the map.

For example, if you had made changes in Profile 1 and wanted to flash those changes to the ECU you would highlight the number 1 and then press **Flash**. Likewise if you wanted to go back to the unmodified FSP Tune you would highlight the blank page icon and then press **Flash**.

Modify: If a Profile number from 1 to 5 is chosen the **Modify** button will open that profile and allow the user to make changes to fuel, ignition, power valve and oil tables. The **Modify** button does not work when the 'Unmodified' blank page icon is selected.

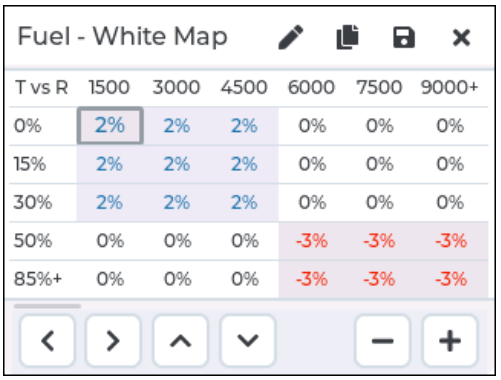
Erase: this button will erase all data in the selected profile if 1-5 are highlighted. This cannot be undone. **Erase** does not work when the 'Unmodified' blank page icon is selected.

6.4.2 Profile Modification Table Overview

After selecting the profile number and pressing Modify you will see the first modification table appear. Swiping to the left will take you through the various tables including fuel, ignition, throttle response and engine braking. The tables appear in the following order:

- Fuel - White Map
- Fuel - Green Map
- Ignition - White Map
- Ignition - Green Map
- Misc - White Map (Throttle Response and Engine Braking)
- Misc - Green Map (Throttle Response and Engine Braking)

Each cell is selected using the arrow buttons on the bottom left corner of the screen. Adjusting each cell is done using the + and – buttons on the lower right corner of the screen.



T vs R	1500	3000	4500	6000	7500	9000+
0%	2%	2%	2%	0%	0%	0%
15%	2%	2%	2%	0%	0%	0%
30%	2%	2%	2%	0%	0%	0%
50%	0%	0%	0%	-3%	-3%	-3%
85%+	0%	0%	0%	-3%	-3%	-3%

- Red numbers indicate that the change may involve possible risk
- Blue numbers indicate that the change is usually safe.
- Black is used whenever 0% is chosen. This indicates that no change will be made to the cell, that is the values in that area will be the same as the values in the FSP Tune that has been selected.
- The pencil icon at the top of the screen allows you to give the profile and name
- You can name the profile from any one of the modification table screens. The name will be saved to the profile and then appear in the previous profile selection screen when the profile number is highlighted.
- The double page icon at the top of the screen allows you to import data from another profile into the current profile
- Each import brings across the complete data set from that profile. For example importing while in the Fuel – Green Map screen will also bring across the data for the Ignition, Engine Braking and Throttle Response.
- The disc icon saves the current profile and any changes that have been made
- You can save the profile from any modification table screen. You do not have to save each screen individually. Pressing save once from any screen will save the entire set of tables in the profile.
- The cross icon exits the profile screen without saving any changes made.
- Pressing this icon in any of the modification table screens will exit the profile modification screens and any changes made in any of the tables will be lost.

6.4.3 Fuel Changes

The fuel tables in each profile show an overview of the changes that will be made to the fuel map if the selected profile is flashed to the ECU.

Fuel values can be changed from -10% to +10% in Pro mode and changes are unlimited in Pro+ Mode.

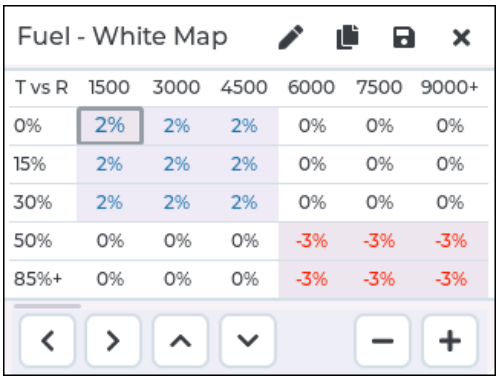
Negative values appear in red (possible risk) and will reduce fuel to the engine, making it leaner. Positive values will appear in blue (usually safe) and will increase fuel to the engine, making it richer.

In order to make the most effective changes it is best to ride with the ERM on the bars during testing. When the bike is acting rich or lean use the Dash screens to get a quick glance at the current rpm and throttle position. This helps to quickly determine the areas where changes are required.

EXAMPLE: A KTM 500 EXCF rider finds that at 25% throttle and 3500 RPM the bike is acting rich and blubbery. The rider selects the FSP Tuned Map they are using, opens Pro Mode, selects the necessary fuel map and then makes changes to the closest cell(s). In this example it would be 30% throttle and 4000rpm. They enter -2% in that cell and flash the profile to the ECU. The engine will now receive less fuel around 30% throttle and 4000rpm. The bike is better but not perfect so they go back and make small changes in the beighbouring cells as well, in this case -1% at 15% throttle and 4000rpm to smooth the transition as the throttle is opened.

BEWARE: Reducing fuel always has some risk. The FSP Tunes are already highly developed and should not require large changes. If an engine is rich to begin with, reducing fuel up to a point will make more power and make the engine smoother and better to ride. Reducing fuel further beyond this point may make the engine lean and increase the risk of damage. A lean engine will generate more heat and may be at risk of failure. When reducing fuel only make small changes of -1% to -2% at a time, then test before making larger changes.

IMPACT OF % CHANGES: Changes to the fuel map in % will increase or decrease the fuel amount set in the FSP Tune by that percentage. For example a value of -5% entered in a cell will result in the new fuel amount being 95% of the previous fuel amount at that rpm/throttle point. Likewise a value of +10% will result in a new fuel amount of 110% of the previous fuel amount.



T vs R	1500	3000	4500	6000	7500	9000+
0%	2%	2%	2%	0%	0%	0%
15%	2%	2%	2%	0%	0%	0%
30%	2%	2%	2%	0%	0%	0%
50%	0%	0%	0%	-3%	-3%	-3%
85%+	0%	0%	0%	-3%	-3%	-3%

6.4.4 Ignition Changes

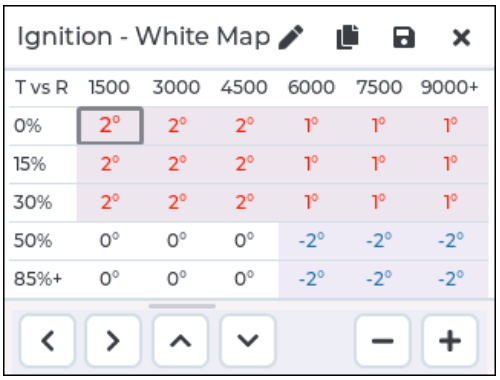
The Ignition table shows an overview of the changes that will be made to the ignition map if the selected profile is flashed to the ECU.

Ignition values can be changed from -5 degrees to +3 degrees in **Pro Mode** and unlimited in **Pro+**.

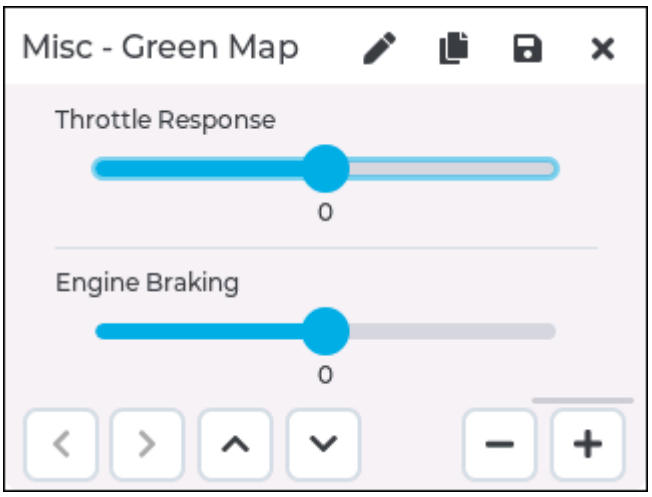
Negative values appear in blue (usually safe) and will reduce ignition advance to the engine, usually making power delivery softer. Positive values will appear in red (possible risk) and will increase ignition advance to the engine, usually making power delivery more aggressive.

BEWARE: adding ignition advance always has some risk. The FSP Tuned Maps are already highly developed and should not require large changes unless the engine is heavily modified. If an engine has a soft ignition setting to begin with, adding more advance up to a point will make more power and the bike will feel better/stronger to ride. Adding more ignition advance beyond this point usually won't add any more power but may increase the risk of engine damage. An engine with too much ignition advance will generate more heat and will have a higher risk of detonation, especially when under load. When adding ignition advance only make small changes of +1 degree at a time, then test before making larger changes. If you notice an audible knock sound coming from the engine this is usually a sign that it has too much ignition advance, not enough fuel, or both.

IMPACT OF CHANGES: Changes to the ignition tables are a straightforward addition or subtraction to the underlying values in the FSP Tune. You can check the current ignition advance at any time on the Dash screens. Ignition advance is expressed in degrees of crank rotation before top dead centre.
If a value is entered in one of the cells it will simply increase or decrease the current underlying value in the FSP Tune. For example, if -3 is entered into one of the cells the ECU will give 3 degrees less ignition advance at that throttle/rpm point. That is, if the current ignition advance was 20 degrees before top dead centre the new advance value will be 17 degrees before top dead centre.



6.4.4 Engine Braking & Throttle Response



The Misc table contains the Throttle Response and Engine Braking sliders. These are 2 of the most powerful features of the 4 stroke ERM.

THROTTLE RESPONSE SLIDER
The genuine KTM Group 4 stroke ECU adds or subtracts ignition advance for a very short period of time as the throttle is being opened in order to change the 'feel' of the power delivery. If ignition is added during this moment the engine will feel more aggressive, accelerating faster and breaking traction more easily. If ignition is subtracted during this moment the engine will feel softer, accelerating slower and maintaining traction in slippery conditions more easily. Once the throttle position stabilises and is held constant the ECU will return the ignition value to 'normal' as determined by the base ignition table. As a result 2 different tunes could have exactly the same power and torque at constant throttle, but feel very different under acceleration. Having control over this gives the user the ability to make drastic changes to the 'feel' of their engine without actually changing overall power and torque at constant throttle.
Every stock tune uses this strategy but unfortunately its not always well implemented and often causes a 'jerky' feeling that some riders complain about at low revs and low throttle.

By adjusting the Throttle Response slider on the ERM the user has control over how much ignition is added or subtracted in the moment the throttle is opened. The resulting difference to engine 'feel' is very significant!

- Moving the slider to the **left** (negative number) will reduce ignition in the moment the throttle is opened, giving a softer feeling to the power delivery.

- Moving the slider to the **right** (positive number) will increase ignition in the moment the throttle is opened, giving a more aggressive feeling to the power delivery.

BEWARE: Any time ignition is increased there is potential for risk. Although our FSP tunes are highly developed there may be some instances due to engine wear, local weather, fuel or

riding conditions where increasing Throttle Response creates an audible knock under hard acceleration. If this occurs simply move the Throttle Response slider back to the left and investigate the underlying cause. Often adding fuel or reducing ignition advance using the 2x2 Basic Tuning Fuel and Ignition tables will be enough to resolve an engine knock without having a noticeable impact on performance.

NOTE: the strategy the ERM uses to adjust Throttle Response is very different to the strategy used by the genuine KTM Connectivity Unit. The ERM strategy has much higher resolution, taking into account far more rpm/throttle positions and overall it is much more effective and changes the feel of an engine.

ENGINE BRAKING SLIDER

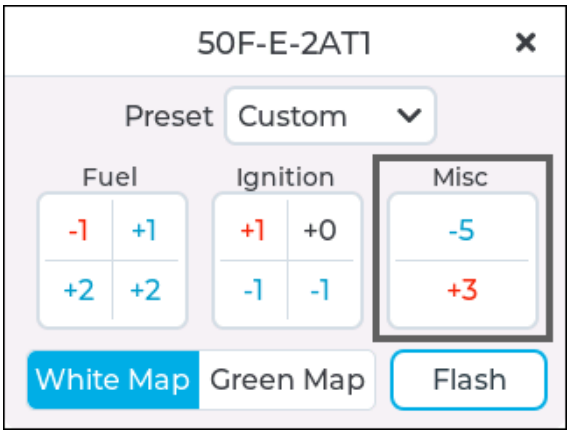
By adjusting the amount of ignition advance at mid/high revs when the throttle is closed we can make a significant change to the level of engine braking felt by a rider. Increasing ignition advance when the throttle is closed at high revs will increase the sensation of engine braking. Decreasing ignition advance when the throttle is closed at high revs will decrease the sensation of engine braking.

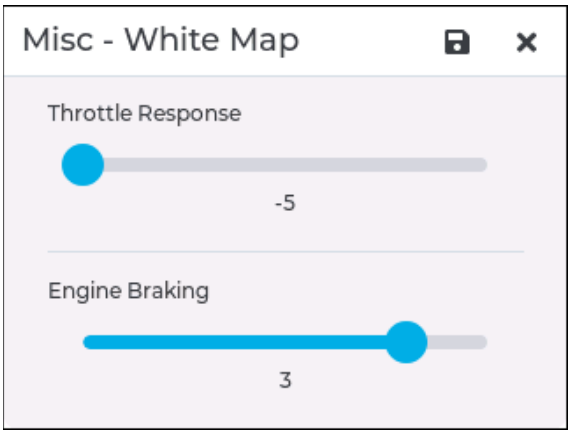
By adjusting the Engine Braking slider on the ERM the user has control over how much ignition is added or subtracted in the moment the throttle is closed at mid/high revs. The resulting difference to engine braking is significant.

- Moving the slider to the **left** (negative number) will reduce ignition in the moment the throttle is closed, reducing engine braking.

- Moving the slider to the **right** (positive number) will increase ignition in the moment the throttle is closed, increasing engine braking.

NOTE: FSP tunes already have changes made to engine braking compared to stock. We generally release our tunes with less engine braking than the stock tunes as it gives a smoother feel to the overall ride. The Engine Braking slider allows the user to make further adjustments to dial in the feel they prefer.
The strategy used by the ERM to adjust Engine Braking is different to the strategy used by the genuine KTM Connectivity Unit. The ERM strategy has much higher resolution, taking into account far more rpm/throttle positions and overall it is more effective in changing the feel of the engine.

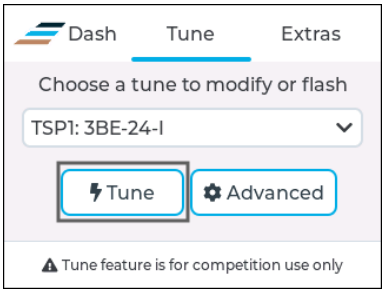


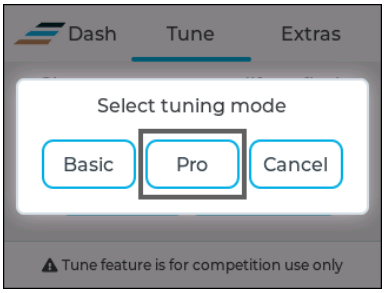


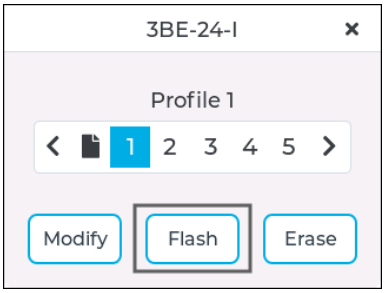
6.5 Flashing a Modified FSP Tune using Pro Mode

To flash a modified FSP Tune to your ECU follow these steps:

1. Select the FSP Tune from the Tune page dropdown menu
2. Press **Select**
3. Press **Pro**
4. Press the Profile number you wish to use
5. Press **Flash**
6. Press **Flash** again to accept the warning
7. **Do not** start the engine or disconnect the battery while flashing.



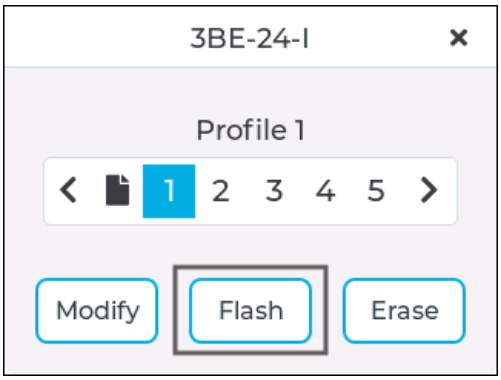


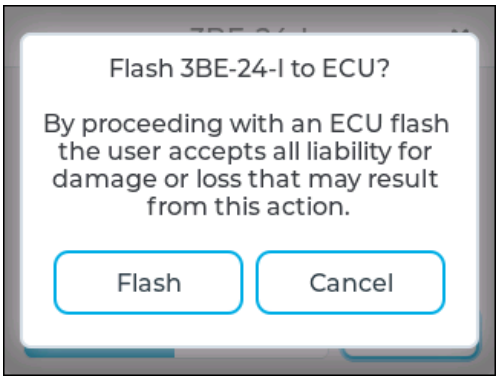


6.6 Flashing an Unmodified FSP Tune or Original Tune Using Pro Mode

To flash an Original Tune or a FSP Tune to your ECU without any further changes follow these steps:

1. Select the Original or FSP Tune from the Tune page dropdown menu
2. Press **Select**
3. Press **Pro**
4. Press the blank page icon ('Unmodified' should appear)
5. Press **Flash**
6. Press **Flash** again to accept the warning
7. Do not start the engine or disconnect the battery while flashing.





6.7 Naming a Profile

Each Profile can be named individually and the name given will appear on the Profile Selector when the profile number 1-5 is highlighted. To name a profile follow these steps:

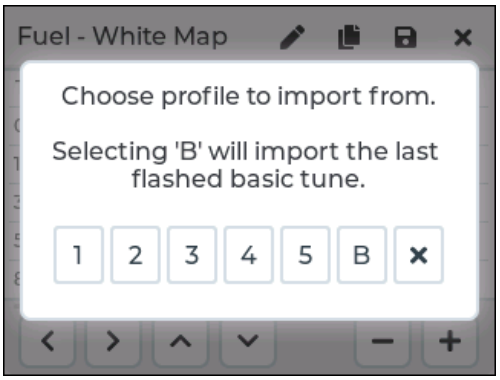
1. Highlight the profile number on the Profile Selector and press **Modify**.
2. From any screen within the Profile Modification Tables press the pencil icon at the top of the screen.
3. Enter the name using the keypad.
4. Press the **Enter** button
5. Press the Save disc icon at the top of the screen
6. Now when you highlight the profile number in the selector you will see the name appear.

6.8 Importing Data from One Profile to Another

It's possible to import data from one profile into another. This is very useful when tuning an engine if you do not want to risk changing one of the current profiles. Rather than making adjustments to the current profile you can import all of its data into a new profile and continue tuning from there. For example, if you had previously created a good tune in Profile 1 and wanted to use that as a basis for a new tune, you would open Profile 2 and then import the data from Profile 1 into it. To import from one profile to another profile follow these steps:

1. Highlight the number of the new profile you wish to begin using on the Profile Selector and press Modify.
2. From any screen within the Profile Modification Tables press the double page icon at the top of the screen.
3. Select the number (1-5) of the profile you wish to import data from.

All data from the selected Profile will now appear in the new Profile. You can now continue to make further changes and then remember to save before exiting the Profile.



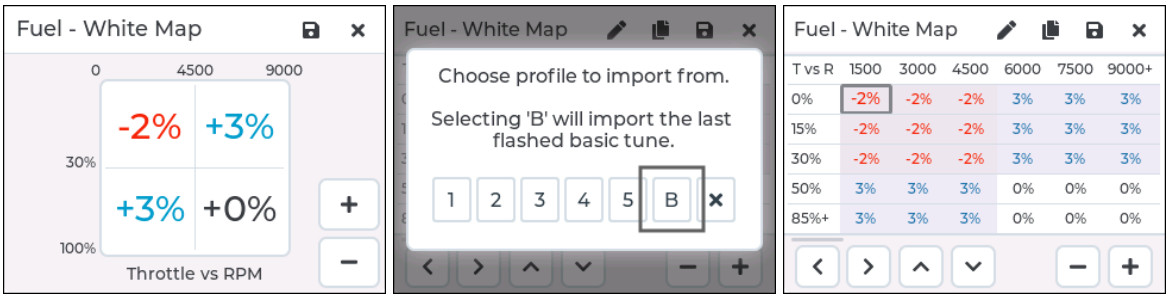
6.9 Importing Data from Basic Tuning to a Profile

It is possible to import that last changes flashed using Basic Tuning into a Profile in Pro Mode. This can be extremely useful if you have been working with Basic Tuning and now want to purchase Pro Mode to make higher resolution changes, or if you just want to learn how Basic Tuning changes appear when viewed in the higher resolution tables of Pro Mode. You can import from Basic Tuning to Pro Mode without needing to pay for the Pro Mode activation, however you can't flash a modified map using Pro mode until the activation has been completed. A quick and easy method of tuning is to start by making broad changes in Basic Tuning and then import those changes to Pro Mode in order to fine tune individual rpm/throttle cells. This will achieve quick results and also is a great way for novice users to learn how to use the knowledge gained in Basic Tuning to further improve their engine with the higher resolution that Pro Mode offers.

To import from Basic Tuning to a Profile follow these steps:

1. Highlight the number of the profile you wish to import Basic Tuning data into using the Profile Selector and press Modify.
2. From any screen within the Profile Modification Tables press the double page icon at the top of the screen.
3. Press the letter B

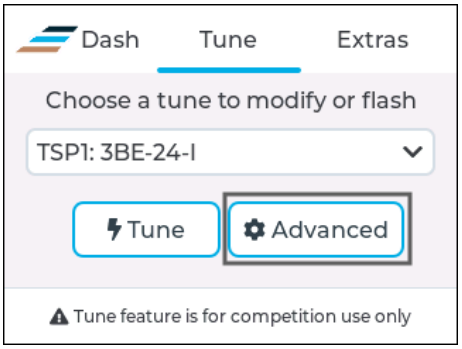
All data from the last flashed tune in Basic Tuning will now appear in the Profile. You can now continue to make further changes, or just swipe through the pages to see how Basic Tuning is broken down into individual cells in Pro Mode. Remember to save before exiting the Profile.



Basic tuning profile imported to pro mode

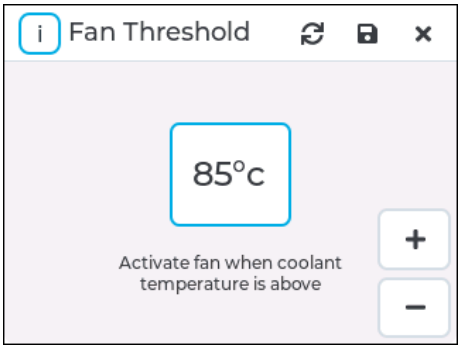
7. Advanced Tune Settings

Whilst **Basic** and **Pro/Pro+** tuning allows a high degree of control over engine characteristics, advanced tuning allows changes that are intended to be used in specific circumstances that might not be applicable to all users. Changes to any of these parameters will affect the tune regardless of whether it is flashed with **Basic** or **Pro/Pro+**, and the tune will need to be flashed for changes to be applied.



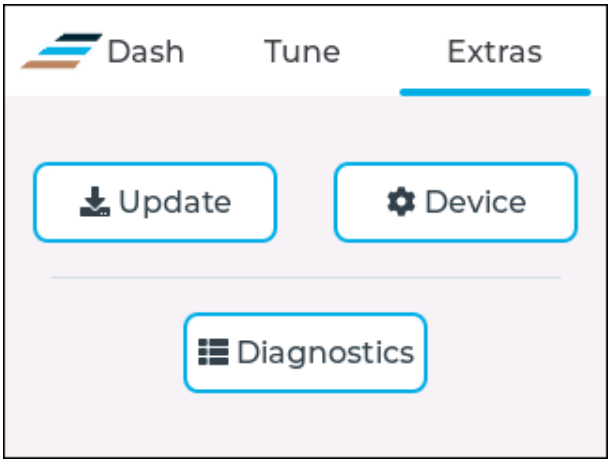
7.1 Cooling Fan

This setting determines the activation temperature of the cooling fan. Stock is 85 - 90°c / 185 - 195°F depending on the model, and the fan will turn off 5°c / 10°F below the on temperature threshold.



8. Extras

The Extras tab at the top right of any ERM screen takes you to a series of useful screens which allow you to perform service functions or view information about the ERM itself. This is separated into three categories: **Update**, **Device** and **Diagnostics** which can be accessed by pressing one of the corresponding buttons.



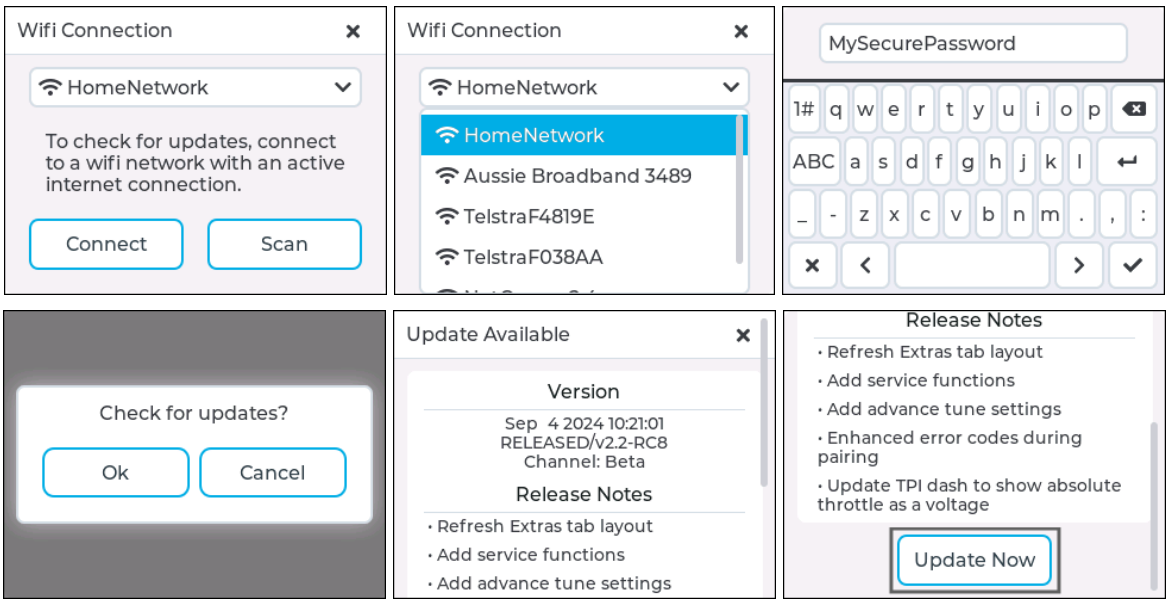
Extras main screen

8.1 Update

This allows you to check for and perform an online firmware update of your ERM. It is recommended to check for updates periodically to ensure you're getting the latest features and improvements.

To check for and perform an online update:

1. Press the **Update** button
2. Choose your home Wifi network, or the Wifi connection from a mobile phone with tethering enabled, and press Connect
3. If a password for this network hasn't yet been saved, enter the password when prompted. Note that the ERM will only store one wifi password at a time.
4. Press **Ok** when prompted to check for updates
5. If an update is available, the information for that release will be shown. Scroll to the bottom and press **Update Now** if you are ready to update.



Update Process

8.2 Device

The device screen covers settings and information relating to the ERM. This includes displaying the Device ID and Verification Code, changing the units of measurement, and performing an ERM transfer if a code has been purchased.

8.2.1 Activation

This screen shows the paid activations that have been purchased for the ERM. These activations can be purchased by logging into the website, buying the necessary activation and then loading a new registration file to the ERM. If the new registration file is not loaded to the ERM then the activations will not function.
Pro Mode: This activation allows the user to flash tunes modified in the Pro section to the ECU. If Pro Mode is not activated the user can still enter Pro Mode and make changes to profiles, but they cannot flash those changes to the ECU.

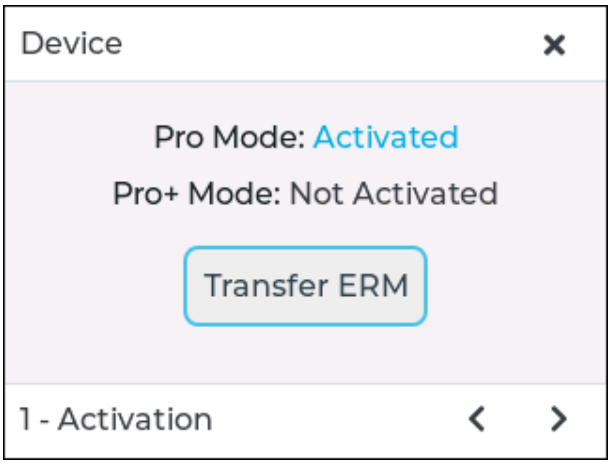
Pro Mode has limitations designed to protect inexperienced users from making changes that may damage the engine. These limitations are as follows:

- Fuel: -10% to +10%
- Ignition: -5 degrees to + 3 degrees
- Throttle Response & Engine Braking: -5 to +5

Pro+ Mode: This activation gives the user the same functions as Pro Mode but with no limitations on the changes that can be made to the tunes. Pro+ limitations are as follows:

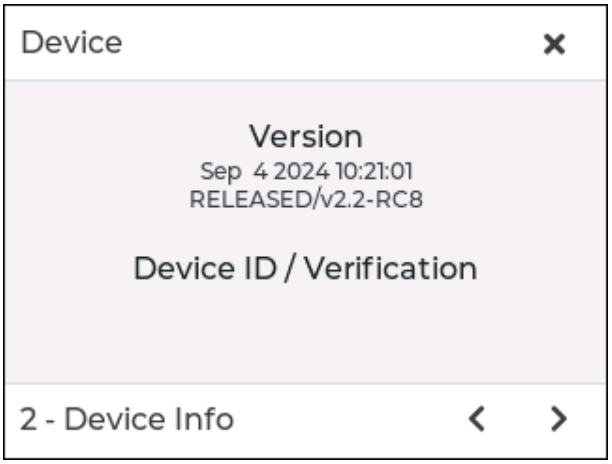
- Fuel: -100% to +100%
- Ignition: -100 degrees to +100 degrees
- Throttle Response & Engine Braking: -5 to +5

Transfer: This allows the user to reset the ERM so that it can be re-paired to a new ECU.



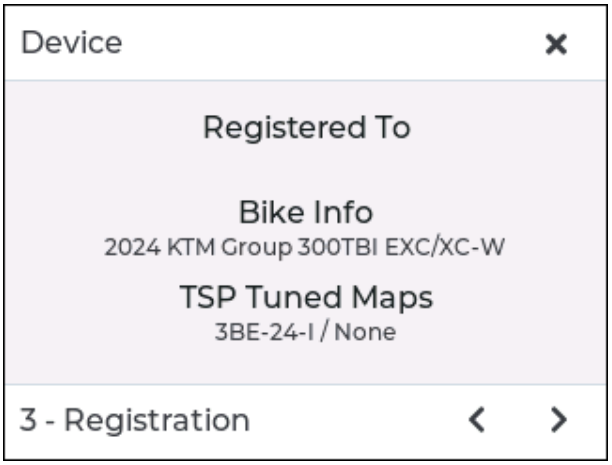
8.2.2 Device Info

This screen shows the ERM firmware version at the top and the ERM Device ID and Verification code at the bottom.



8.2.3 Registration

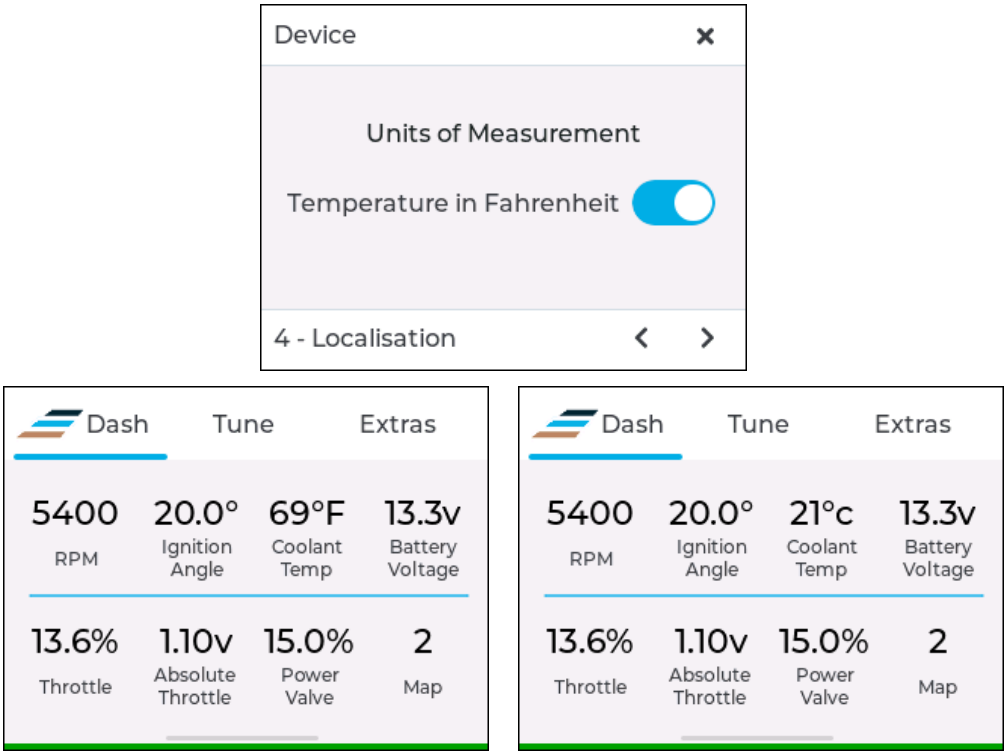
This screen shows the information about the registered user, the make and model of bike the ERM is paired to plus the name of the FSP Tuned Maps currently loaded to the ERM.



8.2.4 Localisation

This page allows you to set up the ERM to suit your preferred units of measurement.

Temperature in Fahrenheit: When enabled, temperature in the dash tab will be shown in fahrenheit, otherwise it will be shown in celsius.



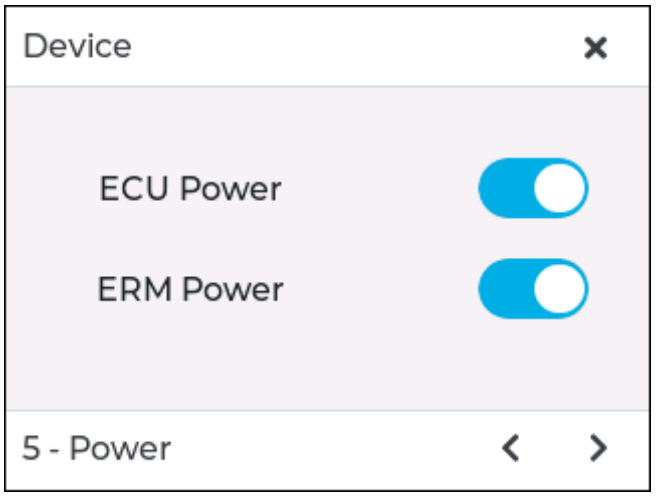
8.2.5 Power

This page shows two toggle switches which control power to the ECU and to the ERM.

ECU Power: pressing this button will deactivate the main power relay on the bike and cut power to the ECU. There is usually a short delay between pressing this button and hearing the relay click to the off position.

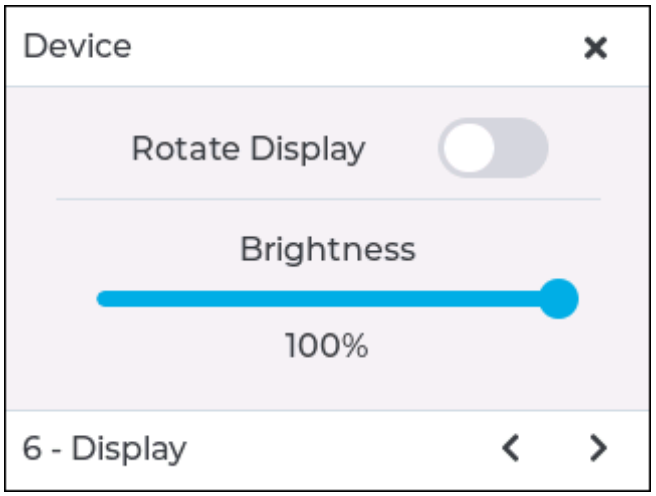
ERM Power: pressing this button will immediately put the ERM to sleep. While asleep the ERM screen will be black and the ERM will not function. To wake the ERM up simply press anywhere on the screen.

NOTE: While the ERM is in sleep mode it will still consume a small amount of power. On most bikes the battery will last 1-2 weeks with the ERM connected but asleep. It's always best to disconnect the ERM from the bike when not in use. The ERM will also fall asleep by itself after a period of inactivity.



8.2.6 Display

Use this screen to adjust the brightness of the ERM display. There is also a toggle switch to rotate the display 180 degrees.



8.3 Diagnostics

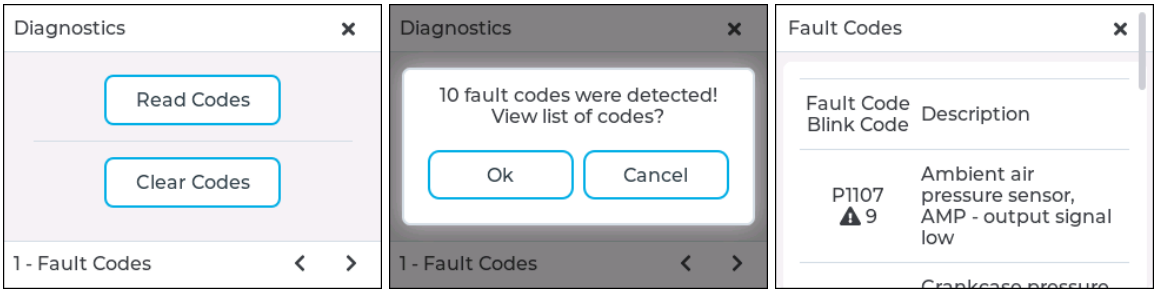
The diagnostics screens allow you to investigate issues with your bike or ECU. This includes the ability to both read and clear fault codes, performing service functions such as running the fuel pump or firing injectors, and also taking a complete read of your ECU to send to FSP to investigate any suspected issues with the ECU or tune.

8.3.1 Fault Codes

The Fault Code screen allows the user to read or clear fault codes.

Read: this button will read the codes and display a list of any present codes. The list of codes will include a P code as well as a blink code. For example the image below shows the code P0122 which identifies a Throttle Position Sensor fault, plus it displays the #6 blink code which relates to the number of times the check engine light on the bike's dash will flash when this code is present.

Clear: this button will clear the list of fault codes. If a code persists after pressing Clear there is fault still present that must be identified and repaired.

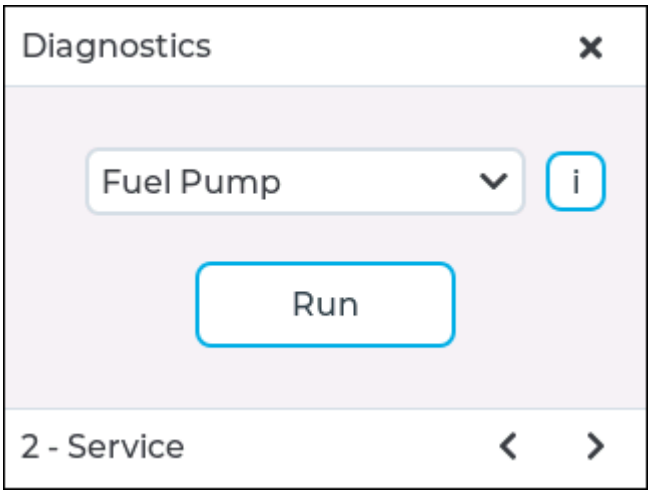


Reading Fault Codes

8.3.2 Service

The service screen allows you to select from, and perform a variety of functions that can assist with setting up and diagnosing faults on the bike. These features include:

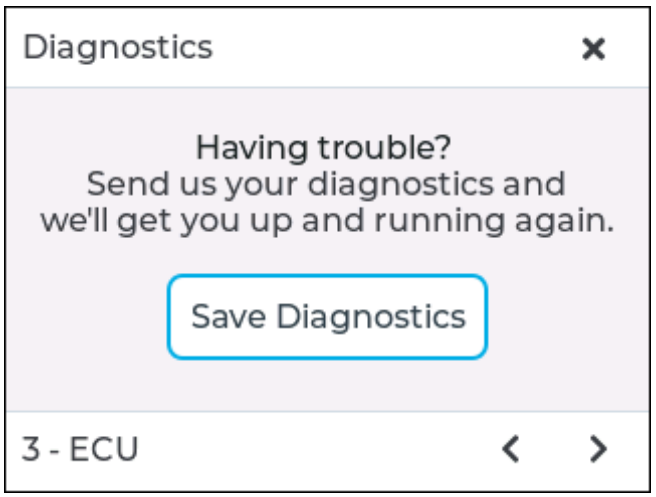
Fuel Pump: Run the fuel pump for several seconds
Ignition: Activate the spark plug 2-3 times. Do **not** touch the spark plug during this test.
Injector 1 / Injector 2: Activate the injector 2-3 times
TPS: View the currently stored TPS zero reference



8.3.3 ECU

This screen allows the user to begin the Diagnostic process. Pressing **Save Diagnostics** will initiate a read of the current tune on the ECU, including any modifications that have been made to it. This file will be saved in the ERM and can be downloaded to your computer using ERM Manager.

In the rare event that you are having serious issues with your bike and want to check that the tune is OK you can download the Diagnostic file and email it to FSP for checking. Note that the file is saved in encrypted format and can only be read by FSP.



9. ERM Website & ERM Manager Software

Please watch the video below on how to use the ERM website and our ERM Manager software. They are an important part of getting the most out of your ERM!

Getting Started 3 - Prepare the ERM before Pairing to an ECU

If your ERM is missing features or requires an update, you can update the ERM firmware through ERM Manager.