

ECU Studio

KTM flash guide



ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com

Contents

1. Introduction.....	3
2. System Requirements.....	4
3. USB Stick (Dongle).....	4
4. Interface Connectors.....	5
5. General notes on ECU Studio.....	5
6. Installation Procedure.....	6
7. Step by Step Licence Load.....	8
9. Step by Step First Flash.....	10
10. Functionality of the MAIN WINDOW.....	12
11. Functionality of the ROM WINDOW.....	13
12. Failed Flash Recovery.....	19
13. Definitions.....	21
14. KTM Specific ECU Functions.....	22
15 ECU Studio custom Race Features.....	25

List of figures

Figure 1 - USB Dongle.....	5
Figure 2 - ECS-01 Interface, also showing Dongle.....	5
Figure 3 - ECU Studio Install Screen.....	7
Figure 4 - ROM update screen.....	8
Figure 5 - MAIN Window.....	8
Figure 6 - Licence Manager Main WindowClick on Add Licences.....	9
Figure 7 - Main Window.....	12
Figure 8 - ROM Map Window.....	13
Figure 9 - ROM Info Window.....	13
Figure 10 - Typical 3D Map.....	15
Figure 11 - Flashing window.....	18



1. Introduction

Congratulations on your purchase of ECU Studio.

For all support enquires, we request that you raise a support ticket via our web interface.

Until this is done our engineers cannot address the request. A support request can be raised by following this link <https://ecustudio.freshdesk.com/support/login>, you may need to register if you have not already done so.

Using the support ticket system allows us to give you a call log number which will allow us to track, manage and respond to your request in the quickest manner possible. The support desk operates Monday - Friday 10:00 - 14:00 CET. If we can address your query outside of these hours we will, of course, endeavour to do so.

ECU Studio is software that through the appropriate interface, enables reprogramming of motorcycle Electronic Control Units (ECU) for a wide range of latest generation makes and models.

The programming software and the supported models are constantly being developed and expanded.

1.1 Main Features

- No hardware changes to the ECU required
- Enable additional features
- Access all standard and some additional maps²
- Ease of use through an intuitive graphical interface
- Data logging via PC
- Live Data displayed on maps
- Diagnosis, service functions and Fault Reset²

ECU Studio is a professional product that is comparable to all class leading ECU configuration and programming software, and should not be confused with simple software such as that supplied with piggyback systems.

CAUTION

- The reprogramming of the ECU may remove the type approval of the motorcycle for use on public roads
- The reprogramming of the ECU may invalidate the warranty of the vehicle
- ECU Studio accepts no responsibility for any possible damage to the vehicle, the driver, the passenger, third parties or articles during the use of the changes made by ECU Studio

ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com

2. System Requirements

ECU Studio requires a Windows 7 or higher operating system, 4 cores CPU, 1024Mb RAM and 2 USB ports. It can be run on Windows XP as well, however no support is provided for this operating system. During installation and upgrades an internet connection is required.

WARNINGS

- ECU Studio is protected by copyright it is prohibited to market or modify without prior written permission
- The software and features are subject to change without notice
- The operating manual is subject to change without notice,

3. USB Stick (Dongle)

ECU Studio is equipped with a USB stick or Dongle. The Dongle is required for ECU Studio to open and function. The Dongle contains the licence for the program. It is important to keep it safe. In the case of loss, breakage or tampering, ECU Studio cannot in any way recover the installation of the program or the purchased licences.

Make sure that the Dongle is always inserted during program execution; do not remove it until the program is closed. The Dongle contains a "Licence ID", which corresponds to your license number, it is indispensable when assistance is required, and it is recommend that you keep it in a safe place. Each licence is coded to a particular Dongle.



ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com

Figure 1 - USB Dongle

4. Interface Connectors

To enable ECU Studio to communicate with the bikes ECU an interface and an adapter cable may be required.

The interface is the ECS-01 USB interface also known as the Red Box, which is a USB to CAN Bus interface, this is connected to the PC via a Micro USB cable, and directly to the motorcycle.

If an adapter cable is required, it will be supplied with the kit. This cable connects between the ECS-01 USB interface and the Bike ECU connector.



Figure 2 - ECS-01 Interface, also showing Dongle

5. General notes on ECU Studio

The user interface of ECU Studio comprises of 3 main parts, the MAIN Menu, ROM window and Map windows.

The MAIN menu opens new ROM files, updates the number of licenses and displays program guides.

Once a ROM file is opened, a ROM window dialog will appear which contains the commands and features for use on the maps (edit, save, send the file to the ECU) and view or enter new information.

You can open more than one ROM file at the same time.

From each ROM window you can open individual Map



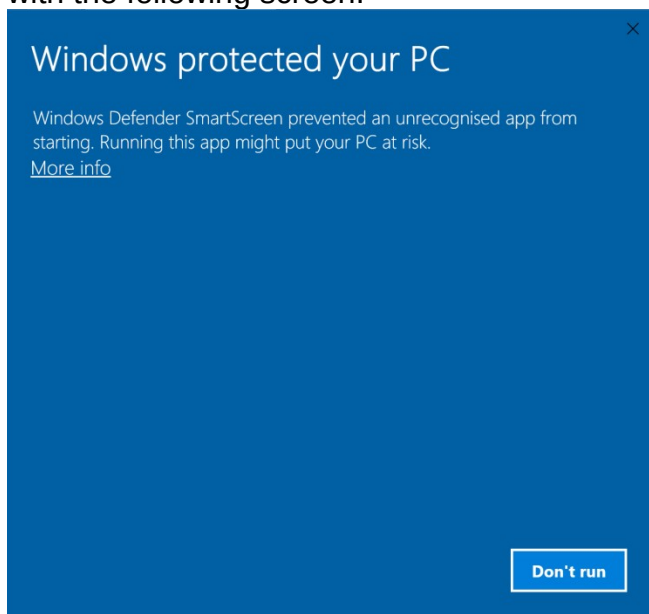
ECU Studio can be set to different "User Levels" these can be selected via the Option / User Level menu Studio in the main ECU window.

It is advisable to periodically open ECU Studio (at least every 15 days), by connecting the PC to the Internet and allowing the program to download and install the continuous updates and improvements from ECU Studio.

6. Installation Procedure

The installation procedure is straight forward, the PC or laptop user account should have administrator rights enabled.

- Download the executable (.exe) file using the link provided by email
- Double click on the executable file e.g. EcuStudio-1388094815.exe to install the software
- Depending on your windows settings windows defender may pause the installation with the following screen.

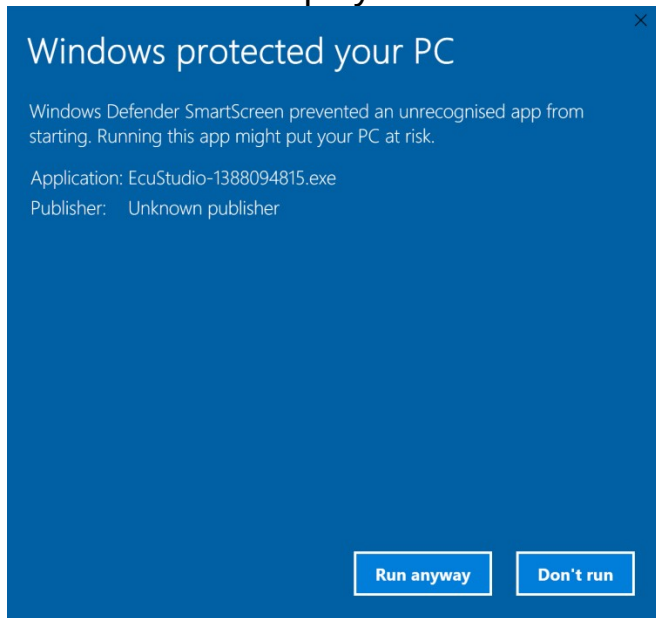


ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com.

- Click on More info towards the top left of the window, the following window will be displayed



Click on Run anyway to continue the installation
The following screen will be displayed

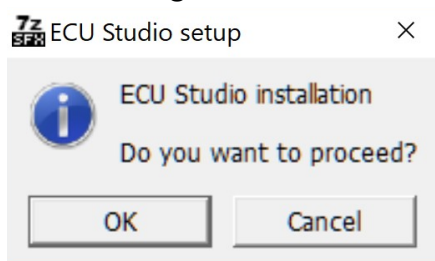


Figure 3 - ECU Studio Install Screen

Click OK to continue with the installation

Insert the dongle (Figure 1) into the PC / Laptop's USB port

- From the Start Menu, click on ECU Studio to start the software
- ECU Studio will automatically perform a check for the latest version of software and Map database. The first use of the software will require a longer download for the whole of the database. Figure 4 - ROM update screen, will be displayed showing the progress of the download

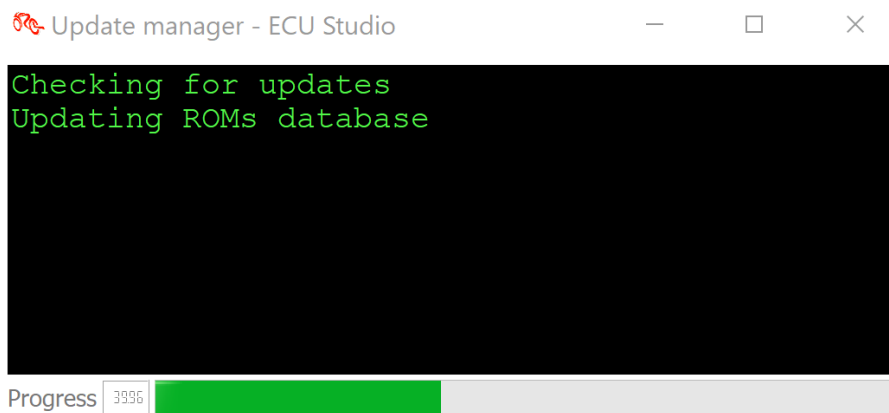


Figure 4 - ROM update screen

- Once the download is complete ECU Studio will automatically open, the following screen will be displayed

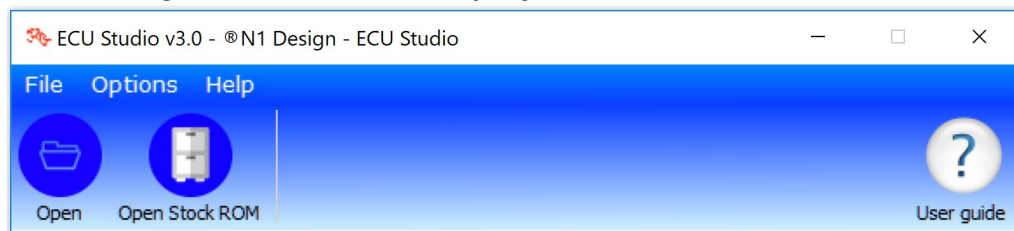


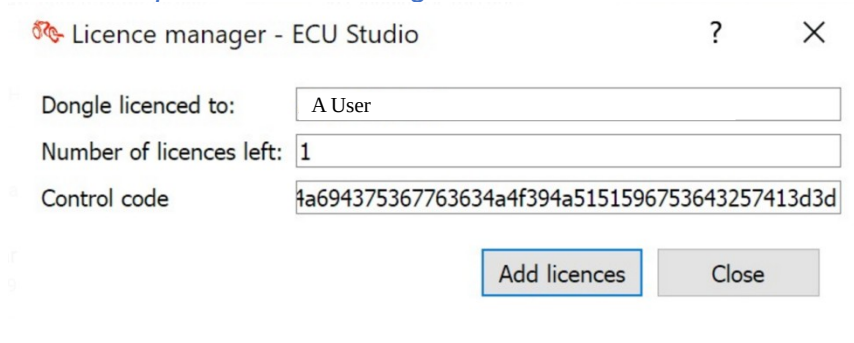
Figure 5 - MAIN Window

7. Step by Step Licence Load

The initial licence purchased would normally be loaded on to your dongle before shipment to you. If you require another licence for any reason, it will be supplied to you by email or a download link.

The new licence file will end with the extension “.lic”

1. Save the new licence file to a safe & known location e.g. a sub-directory in the ECU Studio install location
2. Insert the dongle (Figure 1) into the PC / Laptop's USB port
3. Open ECU Studio (ensure the dongle is installed in a USB port)
4. Click on [Options](#), then [Manage Licences](#)



Licence manager - ECU Studio

Dongle licenced to: A User

Number of licences left: 1

Control code: 4a694375367763634a4f394a5151596753643257413d3d

Add licences Close

Figure 6 - Licence Manager Main Window Click on Add Licences

5. Navigate to the folder where the new licence file is saved, select the new licence file and click [OK](#)
6. The [Number of Licences left](#) should have now incremented by one. ^{1 2}
7. If the number has not incremented, check footnotes 3 & 4
8. Click [Close](#) to finish

Note: the licence files are coded to your specific dongle and will not activate on other dongles.

¹ Note, each licence is encoded to your specific dongle and will not activate on other dongles.

² Note, each licence should be loaded in sequence, failure to apply licences in sequence will prevent the activation of the licence.

9. Step by Step First Flash

The first flash can seem daunting to the uninitiated, to help with this the following is a step by step procedure to your first flash.

Caution

When flashing the ECU is essential to observe the following warnings:

- **DO NOT** disconnect for any reason the USB interface from the PC or from the ECU.
- **DO NOT** unplug the USB stick (licence dongle) for any reason.
- **DO NOT** turn off the ignition of the bike.
- Ensure the PC's battery is charged (>50%) or is connected to the mains.
- Ensure the Bikes battery is fully charged and above 12v
- Ensure the Bike is not connected to a battery charger


Failure to observe the above may result in a failed flash, this may cause the loss of a licence credit, please Section 12 for details of ECU recovery.

9.1 Ensure that ECU Studio has been installed as described in section 6

9.2 Connect the ECU Interface and USB Dongle (Figure 1) to the PC and open ECU Studio

9.3 Load the ROM to be flashed, this can be performed in two ways:

From the **Database**

9.4 Click on the **Database** icon () , select the *manufacturer* and *model*. From the displayed list select the ROM to use, click *OK*

9.5 If you have a specific file.

Click *File* > *Open* and select the file from the directory structure and click *OK*

9.6 The *ROM window* will now be displayed

9.7 Check the settings within the ROM for any features such as Quick Shifter etc that you may wish to change.

9.8 Select the *ROM Info* tab to check the details of the ROM and ensure it is compatible with your bike. Connect the ECU Interface to the bike & turn the ignition on.

Be sure to adhere to the procedure and particularly the warnings in section

9.9 In the *ROM window* menu, select *Program*, *Flash* this will open the flashing window to interact with the ECU,

9.10 Press *Serial Number*

- 9.11 The correct reading of the Serial Number will confirm correct operation of the communications link. Depending on the exact model the following *SW Version*, *SW Revision* & *HW Version* will be populated. If the Serial Number cannot be read, then the communication link is not working, carefully check all connections and retry.
- 9.12 Write or Flash the ECU
By pressing the *Write* button, ECU Studio will flash (write) the whole ROM file (including any changes made since opening the ROM file) to the ECU. Follow the on-screen prompts to turn the ignition off and on.
Flashing the whole ROM can take several minutes to complete. The Flashing Window will indicate the progress on the bar in the lower left-hand corner this may also be mirrored on the bikes Dash.
Note: as it is possible to open more than one ROM file at the same time, to prevent confusion the name of the ROM file is shown next to the Write button.
The flash will now start and you will text appearing on the screen denoting current progress
- 9.13 The flashing will stop, and a warning will be displayed saying “*No licence is present in the ECU. Do you want to use one?*”. **Do not worry this is normal for the first flash** on all ECU's as there is no licence associated with that ECU yet.
- 9.14 Click on *Yes* to proceed
- 9.15 The flash will now continue
- 9.16 Flashing the whole ROM can take several minutes to complete. The Flashing Window will indicate the progress on the bar in the lower left-hand corner this may also be mirrored on the bikes Dash.
- 9.17 Follow the screen prompts when the flashing is complete.
- 9.18 ECU Studio can now be closed
- 9.19 Remove the ECU Interface and Dongle from the PC and store safely.
- 9.20 That's it, you have completed you first ECU Flash using ECU Studio.

10. Functionality of the MAIN WINDOW

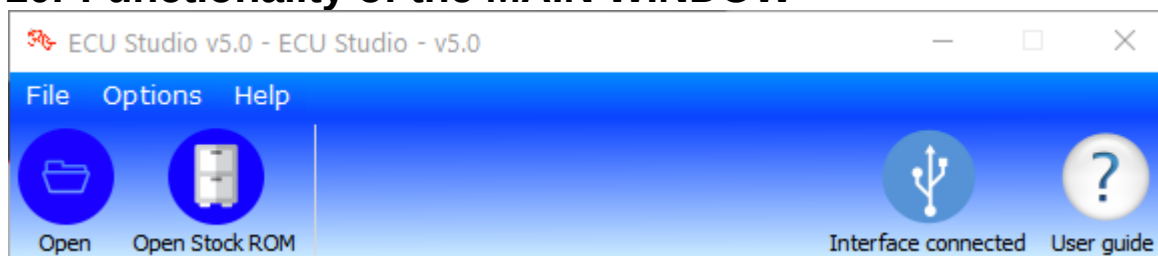


Figure 7 - Main Window

Operation	Shortcut	Description
File		
Open	CTRL + o	Selects the files in ROM format to open
Open Stock ROM	CTRL + r	Selects the files in ROM format to open from the Stock ROM Database
Quit	ALT + F4	Exit Studio ECU
Options		
User Level		Select the level of access to the various functions, ie to partial or full view of the available maps.
Update Interface		Allows the user to update the interface
Manage License		Allows management of purchased licenses
Find ECU		Attempts to reads and display ECU information like model, calibration and VIN number
Help		
User Guide	F1	User Guide (Manual) Shows this guide

ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com

About		About Displays the program version and build number
-------	--	---



Table 1 – Main Program Menu and Keyboard Shortcuts

10.1 User Level

Select your preferred access level from the main menu.

User Level	Permitted Functionality
User	Flash pre-configured Maps only
Edit - Base	Flash pre-configured ROMS & Maps, access to diagnostics and error clearing
Edit - Advanced	Full control of all maps / functions

11. Functionality of the ROM WINDOW

You can open the desired ROM via the Open button , Stock Database button , via the *File > Open* menu, or via the *File > Open Stock Rom* menu.

This will open a new window (**ROM WINDOW**) containing the list of editable maps and special functions available for the selected ROM.



Figure 8 - ROM Map Window

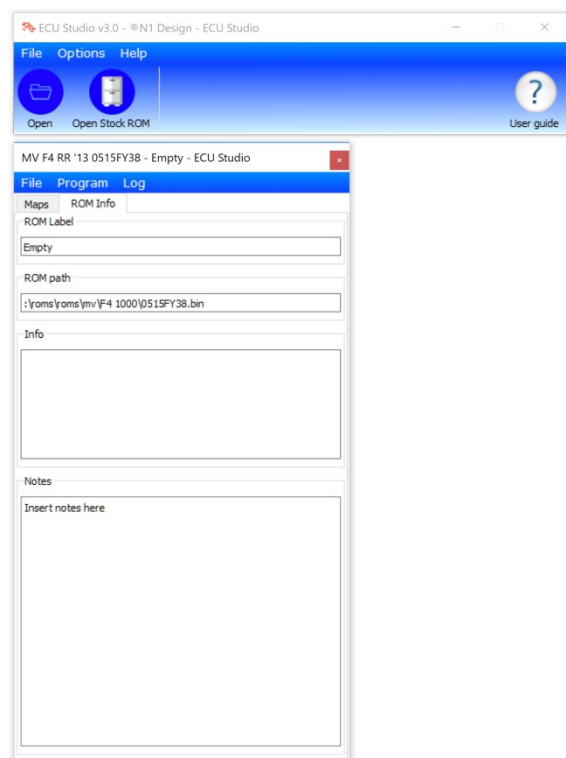


Figure 9 - ROM Info Window

The **ROM WINDOW**, contains two tabs:

- **Maps** (Figure 8) contains all the maps, and constants defined in the ECU, sorted by category.³
- **ROM info** (Figure 9) contains information on the various ROM (name, model, etc.) is not editable by the user; It also contains a Notes field, where the user can enter personal notes.

ROM Window Menu

Operation	Shortcut	Description
File		
Save		Save the contents of the ROM on the hard drive

³ Sort direction and column can be adjusted by clicking on the column header.

Save ROM file as		Save the contents of the ROM on the hard drive with a name of your choice
Quit	ALT + F4	Closes the ROM Window
Program		
Flash		Flash (Write ECU) Opens for reading and writing of the ECU menu. - Serial Number , Provides the ECU ID - Write , Writes the contents of the selected ROM in memory to the ECU - Flash Maps , Writes just the maps of the selected ROM to the ECU - Other bike specific functions , e.g. diagnostics, calibrate ride by wire
Log		
Create Log		Creates a log file of all or a subset of the ECU variables.

Table 2 ROM Window Menu and Keyboard Shortcuts

Map display and Modification

Once the category and / or sub-category is selected, double click on the map to display the data and its graph (Figure 10 - Typical 3D Map).

Where appropriate, the maps are shown in 3D and you can rotate them at will using the mouse, clicking on the chart and holding down the Left mouse key.

Using the table on the left, you can change the values of individual cells or by Multiple Selection. The Multiple Selection is permitted for **Ranges**, **Columns** or **Groups of Cells** where the applicable functions are represented in Table 3.

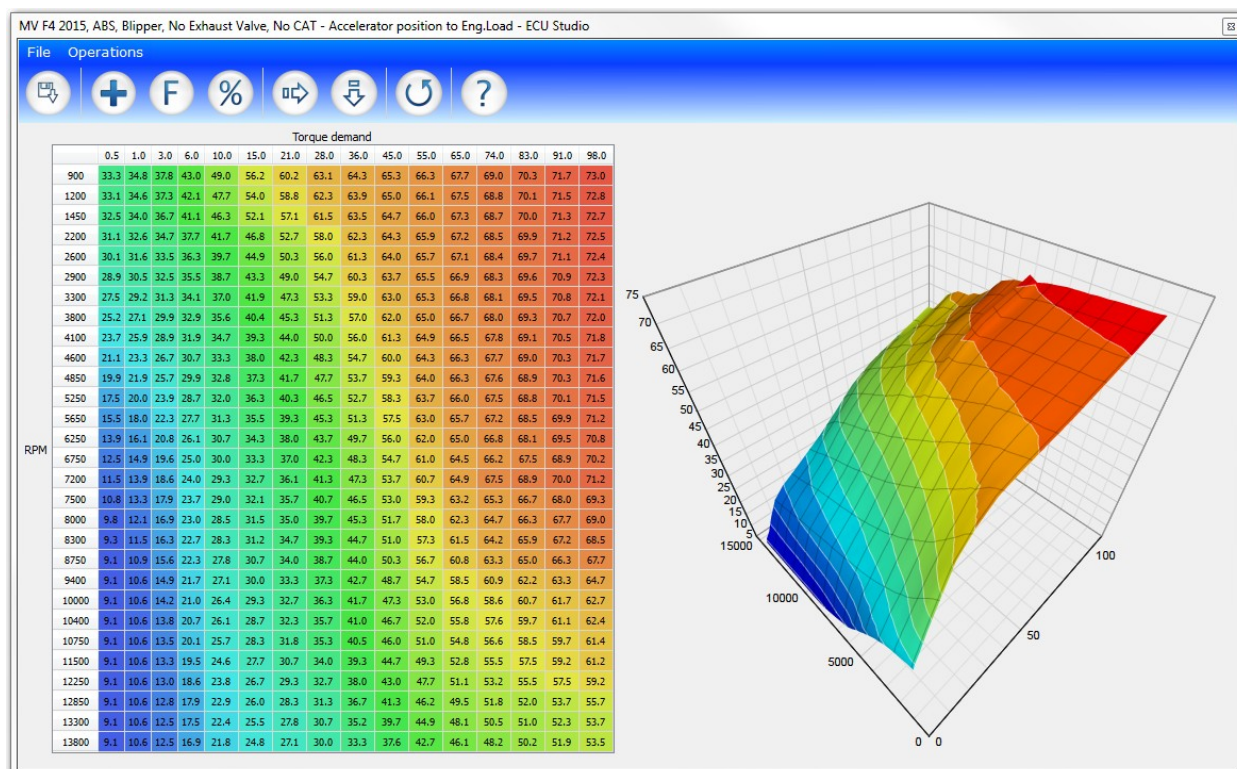


Figure 10 - Typical 3D Map

Operation	Shortcut	Description
File		
Save		Save the changes in Memory, but do not write it to the ECU or to File
Quit	CTRL + w	Exits the map
Operations		
Add	CTRL + a	Adds to a unique value to all selected cells.
Fill	CTRL + f	Fills the selected cells with a unique value
Scale	CTRL + p	Multiply all the selected cells to the entered value The value must be considered as a percentage.

ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com

Operation	Shortcut	Description
		<p>Example:</p> <ul style="list-style-type: none"> • 100 = 100%, the selection remains unchanged • 120 = 120%, the values of the selected cells increased by 20% (120% of the original value) • 80 = 80%, the values of the selected cells are reduced by 20% (80% of the original value) (80% of the original value).
Interpolate horizontally	CTRL + h	Each line of the selection is scaled based on the value of the first cell (furthest to the left) and the last (right-most). The cells in the middle are changed linearly so that the difference between two neighbouring cells is constant. The value of the first and last cell remains unchanged.
Interpolate vertically	CTRL + i	Each of the selection column is scaled according to the value of the first cell (the top one) and the last (the bottom one). The cells in the middle are changed linearly so that the difference between two neighbouring cells is constant. The value of the first and last cell remains unchanged.
Copy	CTRL + c	Copy the selected cells
Paste	CTRL + v	<p>Paste copied cells previously selected area.</p> <p>Note: The paste area must contain the same number of rows and columns as the copied area.</p>
Abandon all changes	CTRL + z	Reverse all changes on the Map

Table 3 – Map Window Menu and Keyboard Shortcuts

Once you finish your changes, you must save them via the Save button





Note: The map is **ONLY** saved in volatile memory, ready to be written (Flashed) in the ECU, but it is **NOT** saved to disk, thus if you exit ECU Studio the changes made will be lost and cannot be retrieved. To save the map to disk, you need to select the [File](#) menu of the ROM Window. (Figure 8)

Programming the ECU

It is necessary to connect the ECS-01 USB interface to the PC and have the adapter installed on the bike. The ignition of the bike must also be on but do not start the engine.

Flashing Precautions

Caution

When flashing the ECU is essential to observe the following warnings:

- **DO NOT** disconnect for any reason the USB interface from the PC or from the ECU.
- **DO NOT** unplug the USB stick (licence dongle) for any reason.
- **DO NOT** turn off the ignition of the bike.
- Ensure the PC's battery is charged (>50%) or is connected to the mains.
- Ensure the Bikes battery is fully charged and above 12v
- Ensure the Bike is not connected to a battery charger

Failure to observe the above may result in a failed flash, this may cause the loss of a licence credit, please Section 12 for details of ECU recovery.

Read Serial Number

From the menu, select [Program](#), [Flash](#) this will open the flashing window to interact with the ECU.

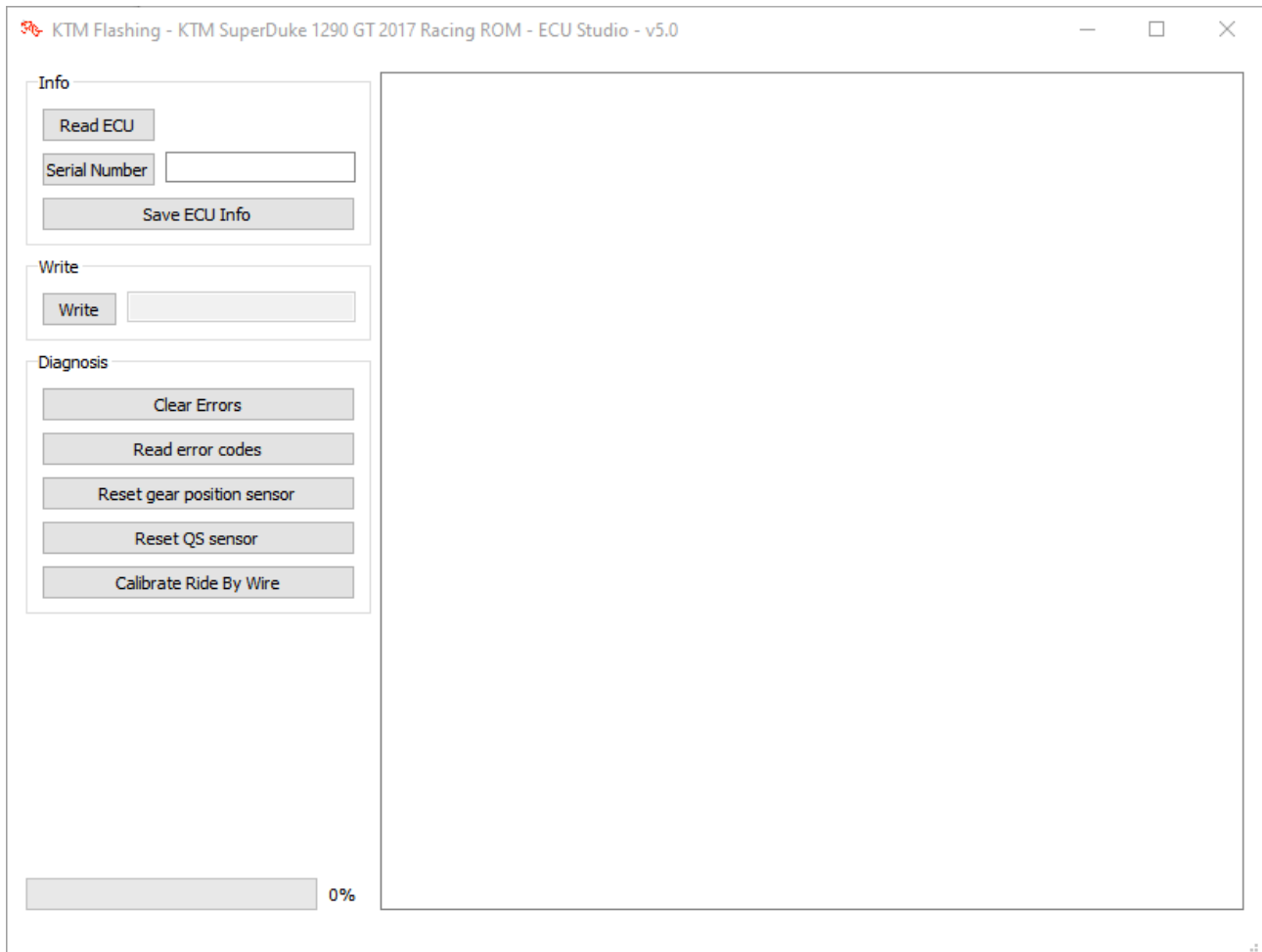


Figure 11 - Flashing window

Press *Serial Number*

The correct reading of the *Serial Number* will confirm correct operation of the communications link. Depending on model, *SW Version*, *SW Revision* & *HW Version* will be populated.

If the *Serial Number* cannot be read, then the communication link is not working, carefully check all the connections and retry.

Write

It is good practice to ensure correct communications are established by first reading the *Serial Number*

By pressing the [Write](#) button, ECU Studio will flash (write) the whole ROM file (including any changes made since opening the ROM file) to the ECU. Follow the on-screen prompts to turn the ignition off and on.

Flashing the whole ROM can take several minutes to complete. The Flashing Window will indicate the progress on the bar in the lower left-hand corner this may also be mirrored on the bikes Dash.

Clear Errors

It is good practice to ensure correct communications are established by first reading the serial number

By pressing the [Clear Errors](#), ECU Studio will clear all errors held in the ECU². Follow the on-screen prompts to turn the ignition off and on.

Calibrate Ride by Wire

It is good practice to ensure correct communications are established by first reading the serial number

By pressing the [Calibrate Ride by Wire](#), ECU Studio will start the calibration of the ride by wire system. Follow the on-screen prompts to turn the ignition off and on and operation of the throttle.

12. Failed Flash Recovery

To recover an ECU that has suffered a failed flash as a result of under voltage, perform the following procedure.

- Turn off the Bike
- Disconnect ECU Studio interfaces from the Bike
- Remove the Main fuse (typically 30 or 40 amp) or disconnect the battery
- Wait 1 minute
- Reconnect the battery or replace the fuse
- Connect the ECU Studio connector
- Turn on the bike and re-flash the ROM

ECU Studio may say that there is no licence associated with the ECU. This is because the licence code will have been lost during the failed flash / re-flash. If this is the case the licence cannot be recovered, and a new licence will need to be purchased. Please take careful note of the warning below.

Caution

When flashing the ECU is essential to observe the following warnings:

- **DO NOT** disconnect for any reason the USB interface from the PC or from the ECU.
- **DO NOT** unplug the USB stick (licence dongle) for any reason.
- **DO NOT** turn off the ignition of the bike.
- Ensure the PC's battery is charged (>50%) or is connected to the mains.
- Ensure the Bikes battery is fully charged and above 12v
- Ensure the Bike is not connected to a battery charger

Failure to observe the above may result in a failed flash, this may cause the loss of a licence credit.

13. Definitions

Terms and definitions used within this help file.

Term	Description
Accelerator	The hand throttle (twist grip) controlled by the rider
Blip / Blipper	Short for Auto down shift blipper. A function that lets the rider change down a gear without the use of the clutch
Database	A collection of applicable Stock ROM files
Dongle	The Dongle is required for ECU Studio to open and function. The Dongle contains the licence for the program & the ECU
ECU	Electronic Control System, the computer that controls the engine in the motorcycle
Flash	The method used to programme the ECU
Flashing Window	The window that is used to control the Flashing process
Licence	A licence is required per ECU.
Maps	A table of data for one parameter
Quick shifter	A function that allows the rider to shift up a gear without the need to use the clutch or back off on the throttle
Quick shifter direction	Standard is used to denote 1 down and 5 up, often referred to as Road shift Reverse is used to denote 1 up and 5 down, often referred to as Race shift
ROM	The data file containing the programme and maps for the ECU
ROM Window	The window that shows the contents and setting of a particular ROM
Throttle	The actual position of the throttle valve inside the throttle bodies
User Levels	The various levels that control the accessible functions for any session
<i>Term</i>	Keyword used in the Software Interface

ECU Studio® is a registered trademark of ECU Studio

All product names, logos, and brands are property of their respective owners. All company, product and service names used in this document are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

www.ecustudio.com.

14. KTM Specific ECU Functions

STANDARD MAPS

Engine Braking

Ignition

Ignition value for gears #2 #3 and #4 during engine brake.

In any other gear the ECU will use the ignition timing coming from the main ignition maps

Throttle

Throttle opening value for gears #2 #3 and #4 during engine brake.

In any other gear the ECU will use the throttle opening coming from the main throttle maps

Fueling

Ex Valve compensation

This table allows the setting of the fuelling compensation based on the exhaust valve position for each gear and Neutral. The tables are 3 dimensional and are **Valve position** vs **RPM**.

- Gear 1 - 3D data
- Gear 2 - 3D data
- Gear 3 - 3D data
- Gear 4 - 3D data
- Gear 5 - 3D data
- Gear 6 - 3D data
- Neutral - 3D data

Quick Fuel compensation

This Table allows the setting of the Quick Fuel compensation for each riding mode.

“Enable fuel compensation” has to be turned ON for this maps to be used by the ECU

The tables are 3 dimensional and are **Throttle** position vs **RPM**.

Rain / Sport / Street / Track Mode

Fueling is dependent on the engine mode selected on the dashboard

IAP Front

Allows the setting of fuel quantity based on the Intake Air Pressure sensor by gear set for the front cylinder. The data table is 3 dimensional and is Intake Air Pressure vs RPM

- Gear group #1 (1st and 2nd gear) - 3D data
- Gear group #2 (3rd and 4th gear) - 3D data
- Gear group #3 (5th and 6th gear) - 3D data

IAP Rear

Allows the setting of the compensation for Intake Air Pressure by gear set for the rear cylinder. The data table is 3 dimensional and is Intake Air Pressure vs RPM

- Gear group #1 (1st and 2nd gear) - 3D data
- Gear group #2 (3rd and 4th gear) - 3D data
- Gear group #3 (5th and 6th gear) - 3D data

TPS Front

Allows the setting of fuel quantity for Throttle Position Sensor by gear set for the front cylinder. The data table is 3 dimensional and is Throttle Position percentage vs RPM

- Gear group #1 (1st and 2nd gear) - 3D data
- Gear group #2 (3rd and 4th gear) - 3D data
- Gear group #3 (5th and 6th gear) - 3D data

TPS Rear

Allows the setting of fuel quantity for Throttle Position Sensor by gear set for the rear cylinder. The data table is 3 dimensional and is Throttle Position percentage vs RPM

- Gear group #1 (1st and 2nd gear) - 3D data
- Gear group #2 (3rd and 4th gear) - 3D data
- Gear group #3 (5th and 6th gear) - 3D data

Ignition

Rain / Sport / Street / Track Mode

Ignition timing is dependent on the engine mode selected on the dashboard

Gear Set #1 (1st and 2nd gear)

- Front #1 – Front cylinder, central spark plug
- Front #2 – Front cylinder, side spark plug
- Rear #1 – Rear cylinder, central spark plug
- Rear #2 – Rear cylinder, side spark plug

Gear Set #2 (3rd and 4th gear)

- Front #1 – Front cylinder, central spark plug
- Front #2 – Front cylinder, side spark plug
- Rear #1 – Rear cylinder, central spark plug
- Rear #2 – Rear cylinder, side spark plug

Gear Set #3 (5th and 6th gear)

- Front #1 – Front cylinder, central spark plug
- Front #2 – Front cylinder, side spark plug
- Rear #1 – Rear cylinder, central spark plug
- Rear #2 – Rear cylinder, side spark plug

Limiters

RPM Limiter

These tables control the limiter function on the RPM. The tables are 2 dimensional and is Coolant Temperature vs RPM

- Hard Limiter (ignition based)
- Soft Limiter (fueling based)

Race Features – end of document

Settings

Enable quickshifter

Enables the stock KTM quickshifter and blipper. The settings won't be visible on the dashboard but it will be activated inside the ECU

EVAP valve

Enables or disables the EVAP valve error. Turn it on when the EVAP valve is removed

Exhaust valve

Enables or disables the exhaust valve error. Turn it on when the exhaust valve is removed

Front O2 sensor / Front O2 sensor heater

Enables or disables the front O2 sensor error. Turn it on when the front O2 sensor is removed or when the pit limiter button is installed

Rear O2 sensor / Rear O2 sensor heater

Enables or disables the rear O2 sensor error. Turn it on when the rear O2 sensor is removed

Maximum idle RPM

Sets the maximum idle target RPM calculated by the bike

Secondary air system (SAS)

Enables or disables the SAS error. Turn it on when the SAS valve is removed

Target idle

Sets the target idle RPM based on engine coolant temperature

Throttle

These tables control the mapping of the throttle. The data is 3 dimensional and is configurable by gear set and for each riding mode.

Neutral

Accelerator percentage vs RPM

Rain – Street – Sport – Track

Accelerator percentage vs RPM

- Gear Set #1 (1st and 2nd gear)
- Gear Set #2 (3rd and 4th gear)
- Gear Set #3 (5th and 6th gear)

15. ECU Studio custom Race Features

These features are part of ECU Studio custom firmware for the KTM SuperDuke 1290. Every feature can be enabled or disabled by the user.

Custom RPM Limiter

These tables control the custom limiter function on the RPM.

The ECU will use the minimum limiter value based on the ECU stock limiter and the custom limiter.

Executed limiter = min (ECU stock limiter, ECUSTudio custom limiter)
--

Enable Racing RPM Limiter (On/Off)

This table controls the Hard limiter function for each gear.

Hard Limiter (ignition based)

This table controls the Hard limiter function for each gear.

Hysteresis

This table controls the amount of hysteresis that the Limiter uses. That is how much the RPM must fall before the limiter function is removed.

Soft Limiter (ignition based)

This table controls the Soft limiter function for each gear.

Engine Braking

These tables control the custom engine braking function.

Gear #1 - #6

This table controls the engine braking for the selected gear and is 2-dimensional, RPM vs Throttle opening.

Engine heater

The automatic engine heater can be activated when the engine is ON, gear in neutral and the sidestand is open (parking position). Pulling the clutch for 2 seconds and releasing it will start the engine heater.

Fuel enrichment

This value sets the fuel enrichment during the engine heater operation

Maximum coolant temperature

This value sets the maximum coolant temperature for the engine heater to work. If the coolant temperature is higher than this value the engine heater will stop

Maximum number of cycles

This value sets the maximum number of "throttle blips" before stopping the engine heater

Maximum RPM

This value sets the maximum number of RPM to hit during the engine heater operation

Time vs Throttle

This 2D table sets the engine heater curve. The ECU will open and close the throttle based on the milliseconds set on the table

Pit limiter

The pit limiter is activated by an external button plugged to the front O2 sensor connector.

The pit limiter does not work in 5th and 6th gear

Enable pit limiter

Turn ON or OFF the pit limiter features

Maximum throttle

Sets the maximum allowed throttle opening when the pit limiter is ON

Target RPM

This map (2D) sets the RPM target for the pit limiter, based on the gear number.

The pre-set values correspond to 60km/h with stock gearing. Change these values if using any other combination of front and rear sprocket.

Quick shifter (ECU Studio)

This features enables both up and down clutchless shifts. In this guide we'll refer to up shifts as "quickshift" (or QS) and down shifts as "blipper"

Minimum APS

Minimum grip position for the QS to work

Settings – Downshift voltage

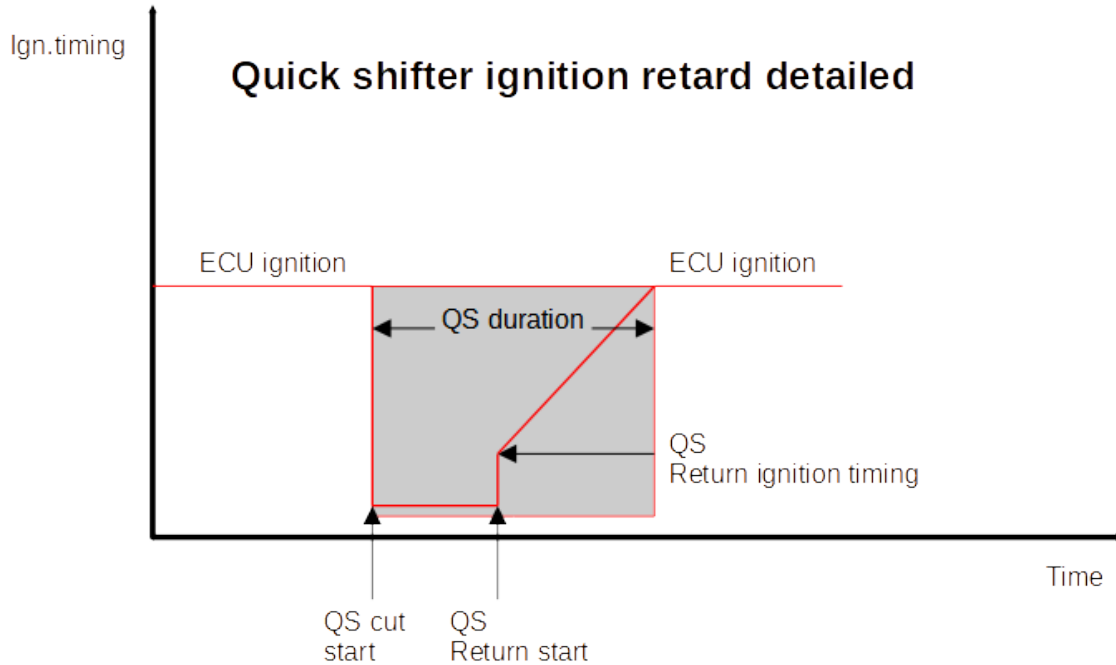
Sets the downshift voltage to start the blipper operation. Any value lower than this will be accepted by the ECU and trigger the blipper

Settings – Rest voltage

Sets the rest voltage for the QS/blipper sensor

QS return ignition timing

This map (2D) sets the retard time to return to the ECU ignition timing after an upshift



Settings – Rest voltage tolerance for downshift/upshift

This value sets the voltage tolerance for the ECU to the sensor at rest position after a down or up shift

Cut times - Rain / Street / Sport / Track

Sets the maximum QS cut time. This value is a maximum value, the ECU will return from an upshift operation as soon as it sees the next gear correctly engaged. Use this value only for failsafe

Enable quickshifter – Rain / Street / Sport / Track

Enables the quickshifter for the select engine mode

Ignition timing during QS cut

Sets the ignition timing value during upshift operations

Quickshifter fuel or ignition cut

Sets the QS cut strategy. This feature can be enabled on:

- Fuel and ignition cut
- Only ignition cut
- Ignition retard
- Fuel cut only

Quick shifter strategy

This value decided which strategy to use, in regards to the cylinder

- Both cylinders at the same time
- Only rear cylinder
- Only front cylinder
- Alternate cylinders: the ECU will perform cuts on both cylinders, alternating them during upshift operations