

PowerTRONIC V4 Maps

Document Version	1	Release Date	10th February 2023
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Application information	Generic
Vehicle	Not Applicable
Model	Not Applicable
Year of manufacture	Not Applicable
PowerTRONIC application	All PowerTRONIC ECU

Note:

- Read through all instructions before installation and use
- Ensure the bike is switched off and the key is out of the ignition before proceeding with the installation
- Some parts of the bike may be hot and will cause burns. Proceed with caution or wait for the bike to cool down.
- Once the installation is complete, make sure to secure the wiring loom away from the movable parts or components which tend to heat up during the normal operation of the vehicle.
- PowerTRONIC is intended for motorsport use on a closed course, please check with your local laws before using this product. Race Dynamics / PowerTRONIC is not liable for consequences that may arise out of using the product.

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1. Maps

A map file is the program containing values that determine the ignition, fuel injection and other vehicle-related settings (Quick shifter, Control Settings, etc) intended for engine operation. A map file contains 2 maps and other necessary settings.

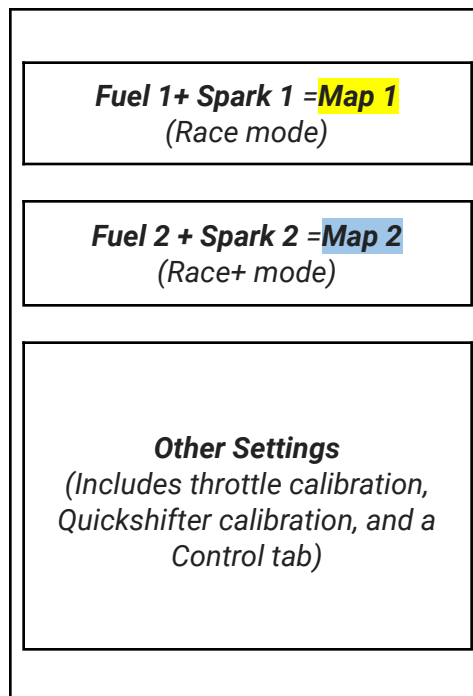
Important Note: The PowerTRONIC ECU has to be connected to the R-Tune to edit/open/save a map file.

A PowerTRONIC map file has 3 parts:

1. Pre-tuned **Map 1 (Fuel 1 and Spark 1)**
2. Pre-tuned **Map 2 (Fuel 2 and Spark 2)**
3. Other settings (Quick shifter, Control Settings, Configuration etc)

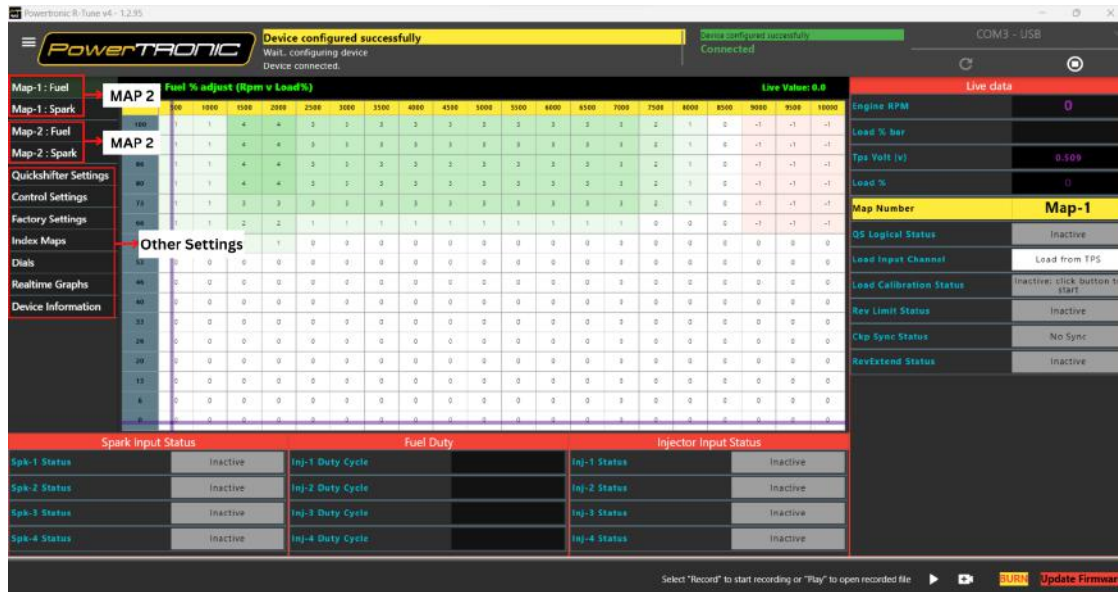
A schematic representation of a map file is given below.

MAP FILE



The PowerTRONIC ECU can store a map file that contains two maps. When you load a map file, you are loading both Map 1 and Map 2 simultaneously.

Refer to the R-Tune user interface below. There are 11 tabs present and each tab directs to each parameter of the map file.



The order of the tabs is as follows

Map 1: Fuel Tab	Map 1	Fuel table of Map 1
Map 1: Spark Tab		Ignition table of Map 1
Map 2 :Fuel Tab	Map 2	Fuel table of Map 2
Map 2: Spark Tab		Ignition table of Map 2
Quickshifter settings Tab	Other settings	Quick Shifter Settings
Control Settings Tab		TPS Calibration, Rev Extn.
Factory Settings Tab		Factory settings
Index Maps Tab		Index Settings
Dials Tab		Dials
Realtime Graphs Tab		Graphs
Device Information Tab		Firmware and other details

2. Switching between maps

PowerTRONIC is shipped with two pre-tuned maps. (Map 1- Race mode, Map 2- Race+ mode).

Map 1 or Race mode offers performance gains starting from lower to mid-range RPMs, whereas Map 2 or Race+ mode is a more aggressive map offering performance gains starting from lower to top-range RPMs.

You can switch between the 2 onboard maps **by connecting (Map 2) (-) or disconnecting (Map 1)(=) the map switch connector on the PowerTRONIC wiring harness (Fig A) or by using the Handlebar Map Switch (Fig B) sold separately.**

**Disconnected - Map1 (-)
Connected - Map 2 (=)**

Fig. A



Fig. B



The chosen map will be active and the other map in the ECU will be inactive.

Active Map

When you read a map file in R-Tune software, all the data in the maps will be present in the tabs, which contain parameters. The active map section in R-Tune will tell you at which map (**Fuel and ignition parameters**) the ECU is working, whether it is Map 1 or Map 2. It may be either **Map 1** or **Map 2**. The other settings are common for both **Map 1** and **Map 2**

A) The map currently running in the ECU is Map 1 (-).



B) The map currently running in the ECU is Map 2 (=).



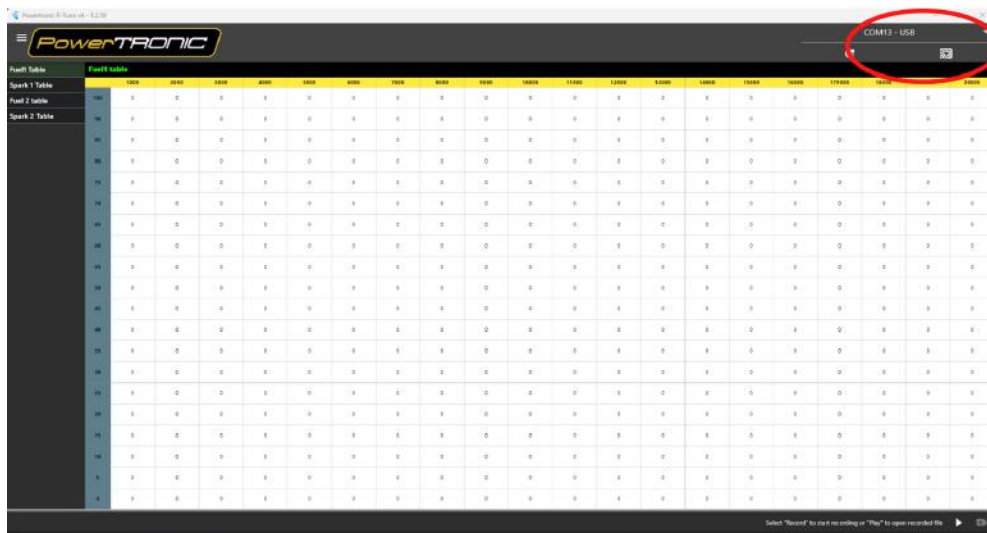
Also, when you save a map file from the ECU or Load a map file to the ECU, it saves/loads both **Map 1** and **Map 2** regardless of which map is active.

You can also observe the **Red LED** on the **PowerTRONIC ECU** to verify which map is currently selected. **One Blink = Map 1 (-), Two Blinks = Map 2 (=)**

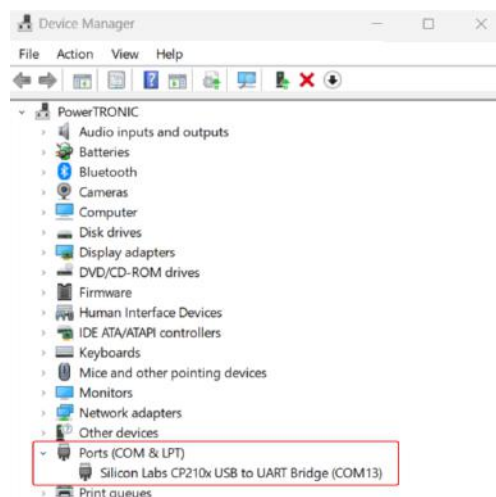
3. Reading the Map from the ECU

To read the map from PowerTRONIC ECU, use the R-Tune software. (Refer to the R-tune Installation and connecting to the ECU manual)

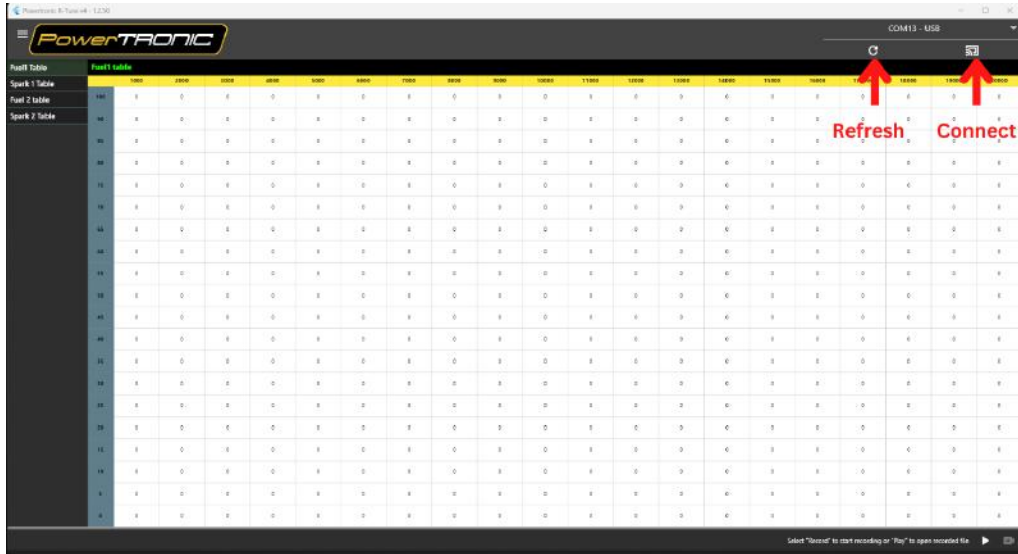
1. Download and Install **Powertronic R-Tune V4** software. (Refer **R-Tune installation manual**)
2. With the PowerTRONIC connected to your bike, use the USB cable and connect it to a windows based PC through R-Tune Software.
3. Select the appropriate com port number. Refer to the Figure below



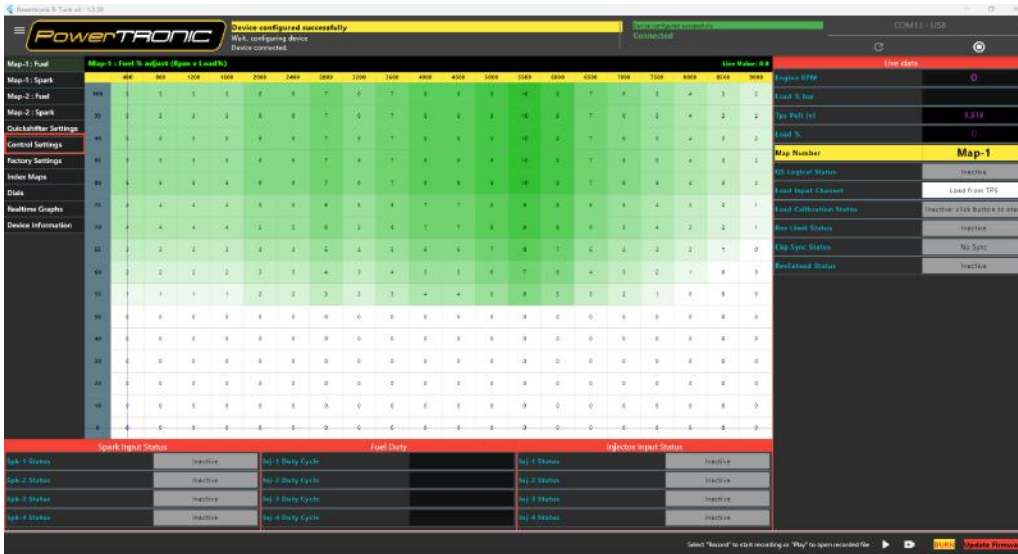
(To check your com port number, go to **Device Manager, Select Ports (COM & LPT)**, and note the number on the **Silicon labs CP210x USB to UART Bridge**. Refer to figure)



4. Click on Refresh and Connect (Select the Appropriate COM Port in drop-down menu).



5. Once connected the Map will be auto-read.



4. Editing a Map on the ECU

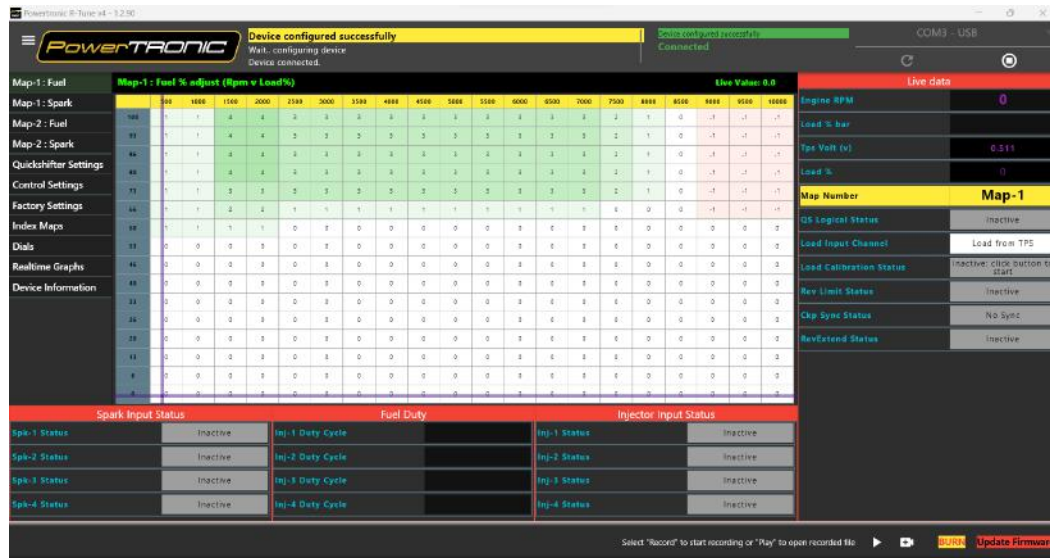
Warning: improper or faulty map value can result in poor performance of the bike and can even cause damage to the engine.

You can edit the maps either by changing the values of the map on the R-Tune interface or by directly downloading a map from our website. A brief description of editing the map is given below. (Refer to the detailed manual of R-tune before editing the maps)

a) Fuel mapping.

Click on the Fuel tab. (Refer to the figure below). The table is used to control fuel delivery through map 1 where you can increase or decrease the quantity of fuel delivered to the engine. The fuel tables denote RPM vs Load and span between min load at the bottom to the maximum load at the top, also minimum RPM on the left and maximum RPM on the right.

The value '0' represents no changes to the fuel injection which is basically the factory settings. Fuel injection is always measured in terms of percentage. The positive value here indicates going richer than stock ECU. In contrast, a negative value indicates going leaner than stock ECU.




b) Ignition Mapping

Click on the ignition tab. (refer to the figure below). The table contains the values to control ignition timing. The value '0' represents no changes to the ignition timing/spark which is basically the factory settings. Ignition timing/spark is always measured in terms of degrees. The positive value here indicates advancing the ignition timing than stock ECU. In contrast, a negative value indicates retarding the ignition timing than stock ECU.

The screenshot displays the PowerTRONIC software interface for configuring ignition mapping. The main window shows a table for 'Map-1: Spark Timing adjust (Rpm v Load%)' with columns for RPM and rows for different maps. The table contains numerical values representing spark timing adjustments in degrees. Below the table, there are sections for Spark Input Status, Fuel Duty, and Injector Input Status, each with four rows (Spk-1 to Spk-4, Inj-1 to Inj-4) and status indicators (Inactive). On the right side, there are live data readouts for Engine RPM (0), Load % bar, Ignition Voltage (0.521), and Load % (0). The interface also includes a 'Live data' section with various status indicators and a 'Map Number' dropdown set to 'Map-1'.

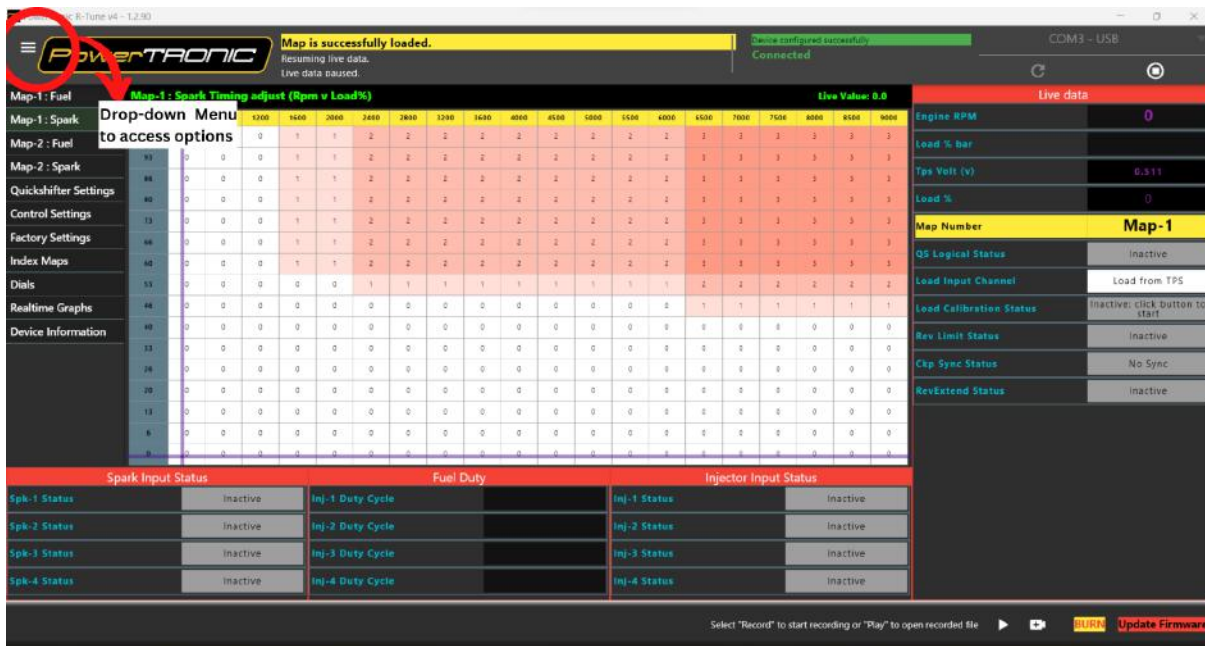
5. Opening the Map file from a folder of your PC/Laptop

1. Connect the ECU to the R-Tune software
2. Click on Hamburger Menu Icon in the Top Left Corner 
3. Open the Calibration File
4. Select the Downloaded or Saved PowerTRONIC V4 Map files saved in .cdat format.
5. Click open to read the Map and view the values

1. Connecting ECU to R-Tune Software,

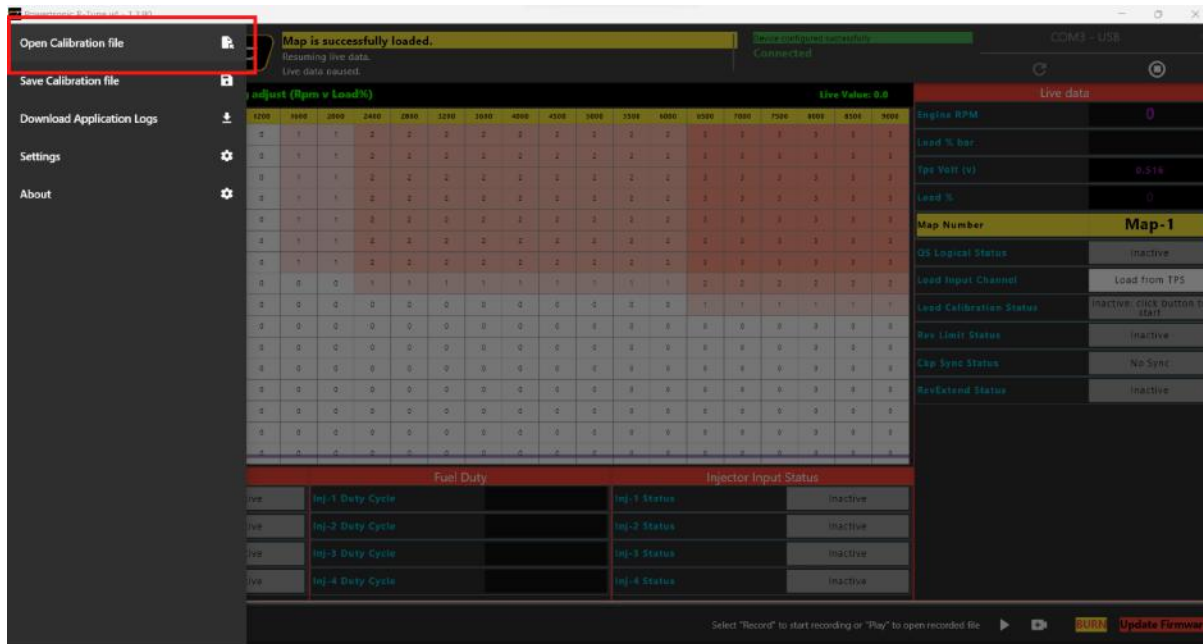
(Refer to Page 07 on Reading the Map from the ECU)

2. Click on Hamburger Menu Icon in the Top Left Corner

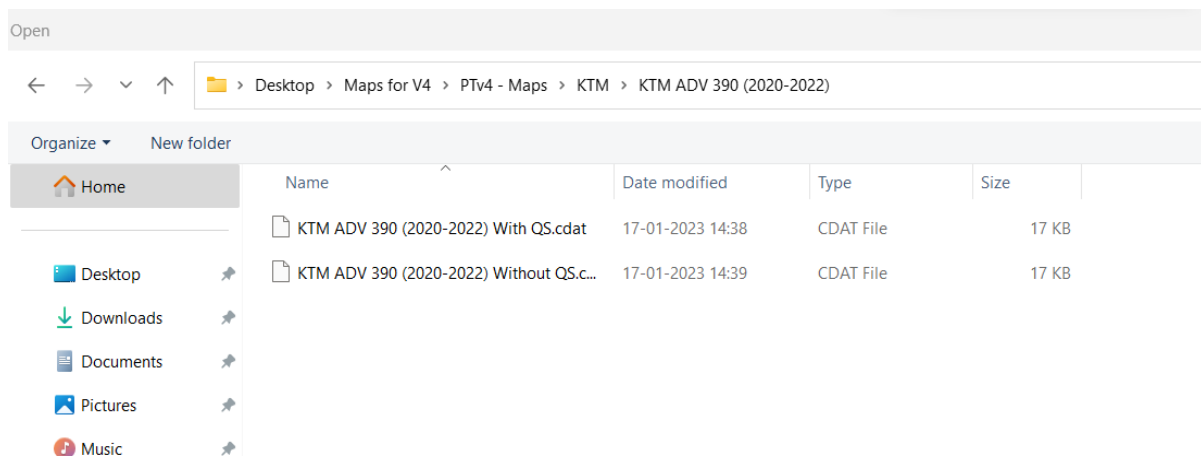


The screenshot shows the R-Tune software interface. At the top, a yellow banner reads "Map is successfully loaded. Resuming live data. Live data caused." Below this, a table displays "Map-1 : Spark Timing adjust (Rpm v Load%)". The table has columns for RPM (5200, 5600, 6000, 6400, 6800, 7200, 7600, 8000, 8400, 8800, 9200, 9600, 10000, 10400, 10800, 11200, 11600, 12000) and rows for different load percentages (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10). A red circle highlights the hamburger menu icon in the top left corner, with a text box pointing to it that says "Drop-down Menu to access options". On the right side, a "Live data" panel shows various engine parameters: Engine RPM (0), Load % bar, Tps Volt (v) (0.511), Load % (0), Map Number (Map-1), QS Logical Status (Inactive), Load Input Channel (Load from TPS), Load Calibration Status (Inactive; click button to start), Rev Limit Status (Inactive), Ckp Sync Status (No Sync), and RevExtend Status (Inactive). At the bottom, there are sections for "Spark Input Status", "Fuel Duty", and "Injector Input Status", each with four rows of status indicators.

3. Open the Calibration File

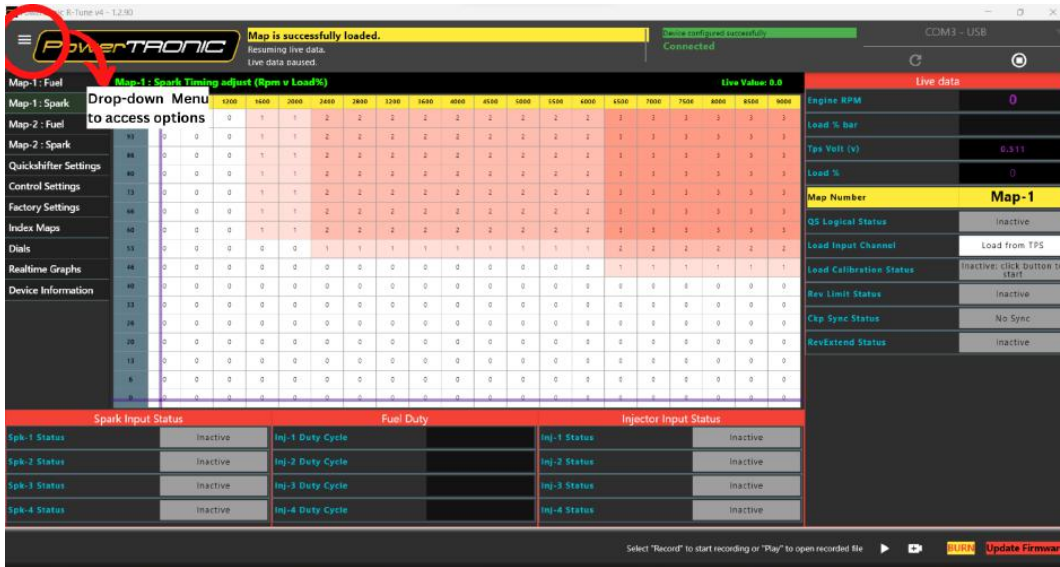


4 and 5. Select the Downloaded or Saved PowerTRONIC V4 Map files saved in .cdat format. Click open to read the Map and view the values

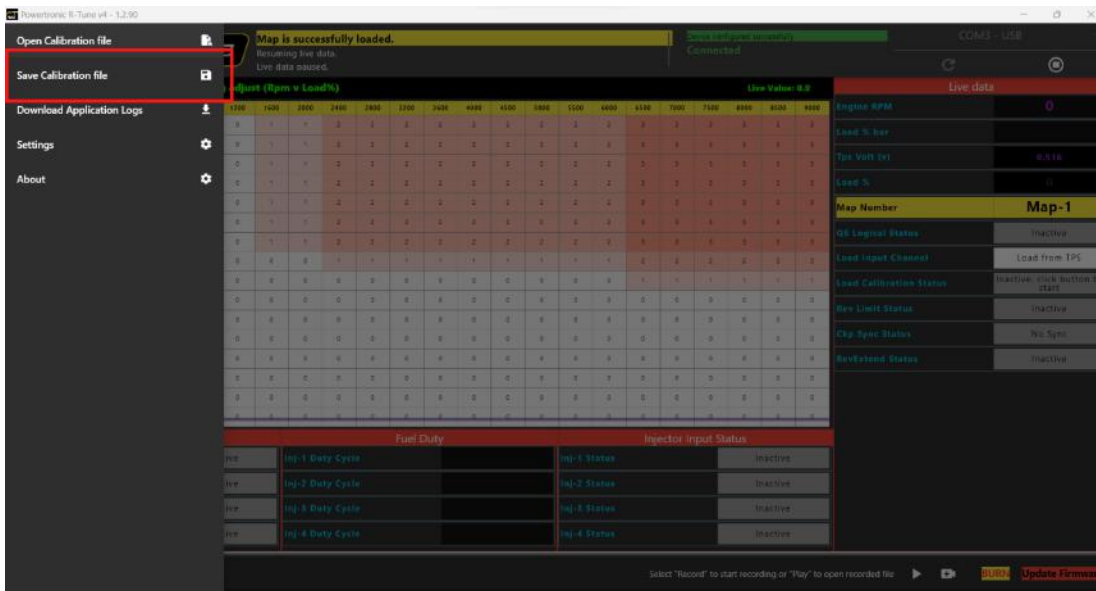


6. Saving the map to the file folder of your PC/Laptop

1. Connect the ECU to the R-Tune software
2. Click on Hamburger Menu Icon in the Top Left Corner

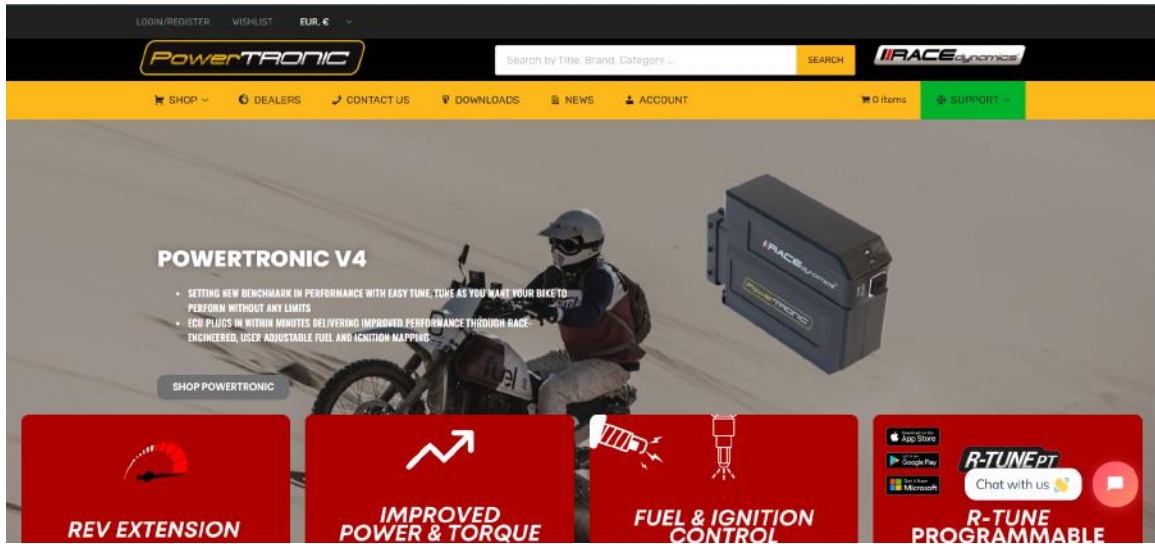


3. Click on the Save Calibration File and then choose the location you want to save, add the file name in the File name tab, and click on Save

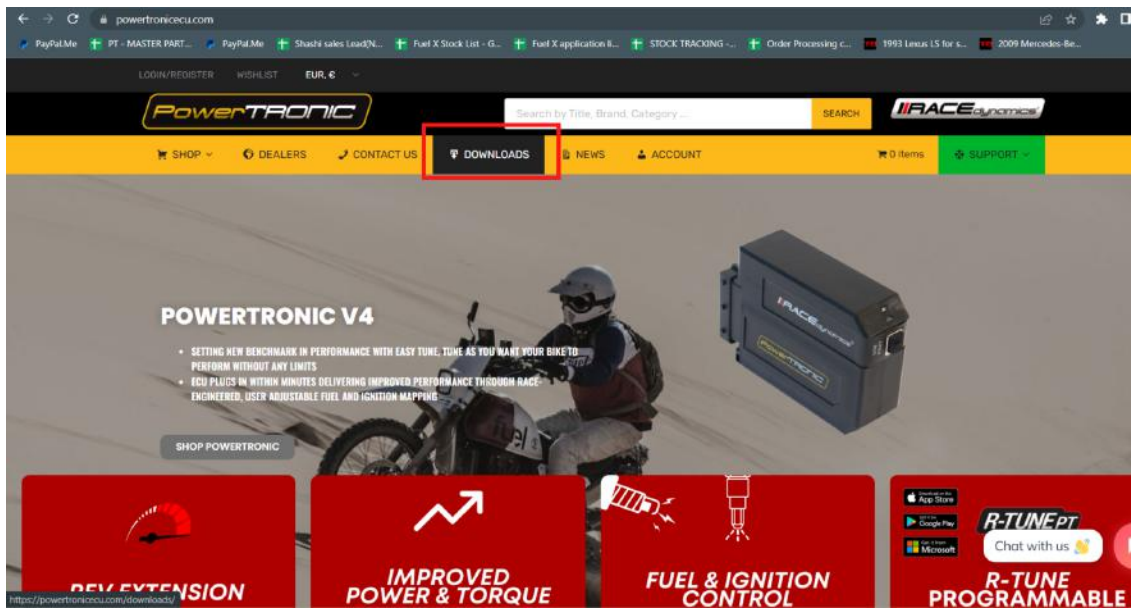


7. Downloading a map from the website

1. Go to www.powertronicecu.com



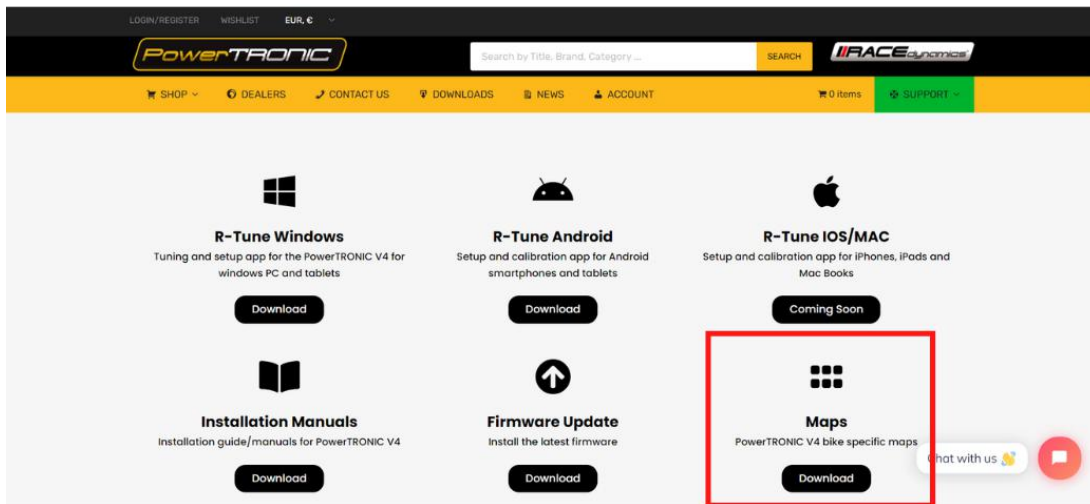
2. Click on Downloads



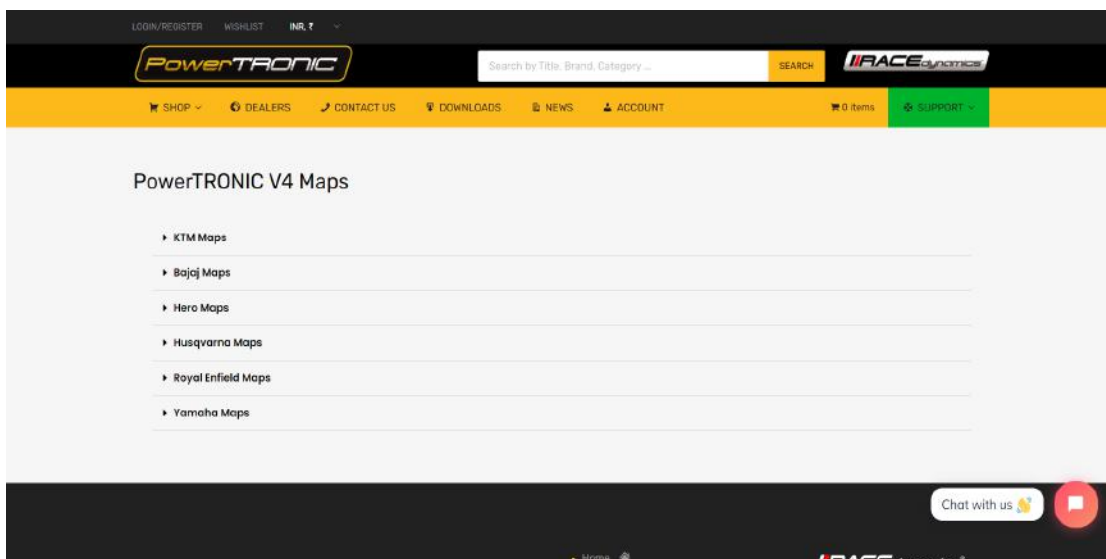
3. Scroll down and click on the Download for PowerTRONIC V4.



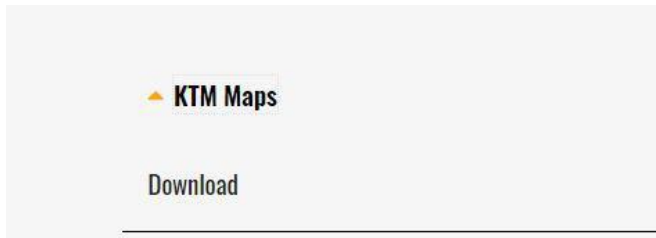
4. Click on Maps (PowerTRONIC V4 bike-specific maps)



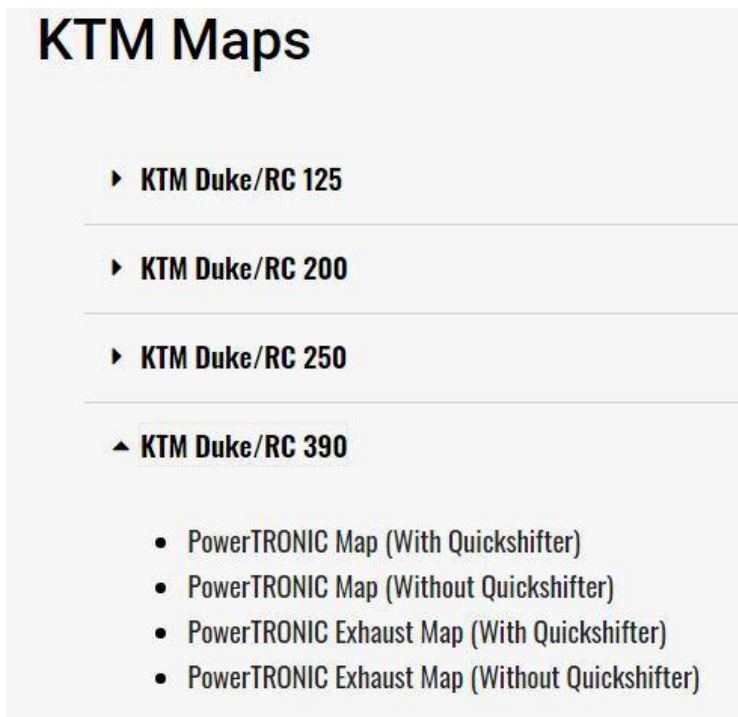
5. Select the Make and model of your bike from the list.



6. Click on the Download option under the make



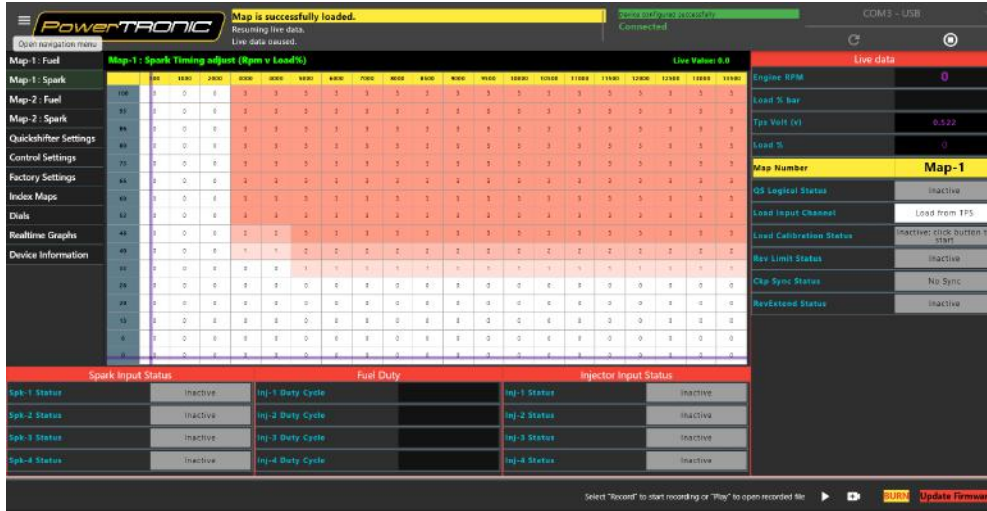
7. Select the model and download the appropriate map.



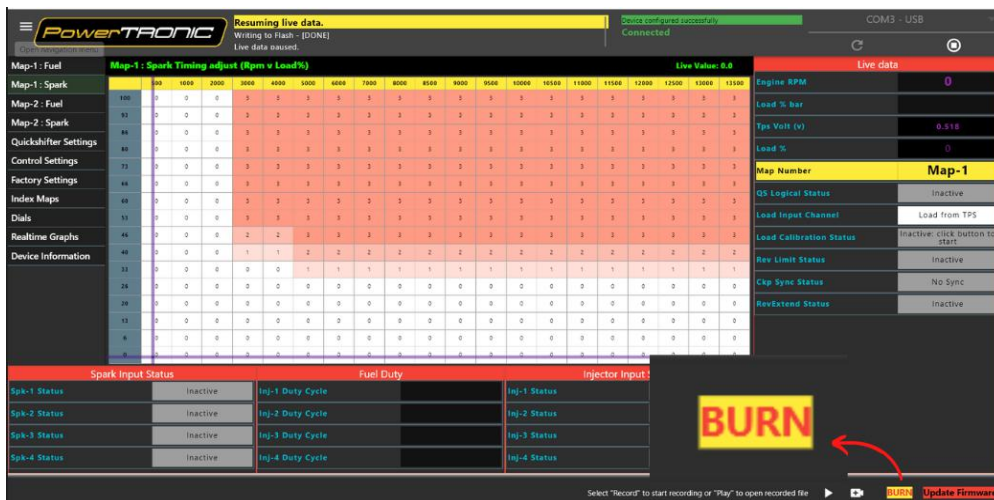
8. Burning a map to ECU

To load a new map file:

1. Connect the PowerTRONIC ECU to your Windows PC using the USB cable.
2. Open the R-Tune software.
3. Select the appropriate **COM** port number.
4. Click on **Connect**.
5. Connecting ECU to R-Tune Software, (Refer to Page 07 on Reading the Map from the ECU)



6. Once the Changes are done on the Map Click on Burn.



Control settings

A) Load setting

Load Input channel	Shows the Load input Channel to the ECU
Load channel Select	The PowerTRONIC can derive load from either (a) Throttle Position Sensor or (b) Injection Pulse Width. On vehicles that have a Throttle Position Sensor available, use the Load input channel Throttle Position , and the bikes without TPS connectors select the Injection Pulse Width option.
Load Calibration	Is the option to do the TPS calibration procedure. For Throttle Position Sensor Calibration , refer the individual PowerTRONIC V4 Throttle Position Sensor Calibration Manual
Load Calibration Ststus	Shows the status of each steps in the TPS calibraion
Load % bar	Shows the Load input percentage as a progressive bar (the bar varies from minimum to maximum correspondng to th 0 and 100%
Load %	Shows the Load percentage in Values (Value varies from 0-100%)
TPS Volt (v)	Shows the realtime TPS voltage
Load TP Raw min	Shows the TPS voltage corresponding to the idling or 0 position of the throttle after the Load calibration by TPS
Load TP Raw max	Shows the TPS voltage corresponding to the maximum or wide open throttle position of the throttle after the Load calibration by TPS
Inj Pw Raw	Shows the realtime injector Pulse width
Load Inj Pw Raw Min	Shows the Injectoer Pulse width value corresponding to the idling or 0 position of the throttle after the Load calibration by Injector Pulse width
Load Inj Pw Raw Max	Shows the Injectoer Pulse width value corresponding to the maximum or wide open throttle position of the throttle after the Load calibration by Injector Pulse width
RevExtend Status	Shows the Rev Extension realtime status

B) Rev Extend and Limiter Settings.

Rev Limit RPM	Set the Rev limit of the vehicle. (Please note that, for some models, the rev extension is disabled by default) * Do not edit the value unless mentioned by the manufacturer
Rev Limit Type.	Select the type of rev cut at the limiting RPM. * Do not edit the value unless mentioned by the manufacturer.
Rev Limit Status	Shows the real-time status of the Rev limit
CKP sync Ststaus	Shows if the input from the Crankshaft position sensor is in sync with the set CKP family
Rev Extend type	Enables/ or Disbales of the rev extension feature * Do not edit the value unless mentioned by the manufacturer.
RevExtend Status	Shows the Rev Extension real-time status
Load % on	* Do not edit the value unless mentioned by the manufacturer.
Load % off	* Do not edit the value unless mentioned by the manufacturer.
RPM on	* Do not edit the value unless mentioned by the manufacturer.
RPM off	* Do not edit the value unless mentioned by the manufacturer.
CKP Family	Set the type of the CKP family based on the input from the CKP sensor.
Tooth Gap Min %	* Do not edit the value unless mentioned by the manufacturer.
Tooth Gap max %	* Do not edit the value unless mentioned by the manufacturer.

C) Fuel and Spark

Spk Noise Filter	Set the noise filter for Spark signal
Inj Noise filter	Set the noise filter for Injector signal
RPM Channel Select	Controls from which channel, the RPM data is derived
SPK Signal Ratio Threshold (0 to disable)	* Do not edit the value unless mentioned by the manufacturer.
Spark Signal ratio	Shows the real-time Spark signal ratio

D) Live Data

Engine RPM	Shows the Live RPM
Load % bar	Shows the Load input percentage as a progressive bar (the bar varies from minimum to maximum corresponding to the 0 and 100%)
TPS Volt (V)	Shows the realtime TPS voltage
Load %	Shows the Load percentage in Values (Value varies from 0-100%)
Map Number	Shows the map currently running in the ECU
QS Logical Status	It shows whether the QS sensor is active or In-active
Load Input Status	Shows the Load input Channel to the ECU
Load Calibration Status	Shows the status of each step in the TPS calibration
Rev Limit Status	Shows the real-time status of the Rev limit
CKP Sync Status	Shows if the input from the Crankshaft position sensor is in sync with the set CKP family
RevExtend Status	Shows the Rev Extension real-time status

Quickshifter settings

For Quick shifter enabling and calibration, refer to the individual PowerTRONIC V4 Quick shifter Installation and Calibration Manual

---/End of Document/---