Quick Guide for Electronic Updates & Calibrations v2

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Quick guide valid only for Gen2 TCR cars, using TCR Marelli ECU:

- CUPRA Leon Competición
- Audi RS3 LMS TCR
- CUPRA Leon VZ TCR

1. CAR DEVICES AND LAPTOP INTERFACES

Car devices

ECU MARELLI	ADU display	GATEWAY UNIT
• License by VAG dongle, see parts catalogue	• License free. SW available at the VAG mts platform	• License temporary on demand
		
GPS / Antenna • License free. SW available at the VAG mts platform		
		

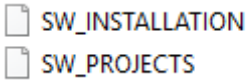
Laptop Interface tool:

CAN interface part nº: 5FR910336	New Peak-Can interface / from 2024 onwards Catalogue part nº: 5FR910336A
	
Ethernet cable (market std.)	
	

2 PROGRAM FILES

Where can you find all the files you may need?

Find all necessary files into two .zip folders available at the online platform in the “PROJECTS & SOFTWARE” section.



https://vwgroupmotorsport-onlineplatform.com

What is included on this .zip files?

- **SW_INSTALLATION**
  - Last version Firmware and Software for the devices installed into your car.
- **SW_PROJECTS**
  - Last version of Projects and Configurations for the SW installed on your laptop/devices.

IMPORTANT: The latest published versions usually correct errors or update the devices to comply with regulations updates. It’s highly recommended to maintain the racing car updated to last version.

3 ECU MARELLI

There are two software from Marelli to manage ECU SRG-141 TCR, SYSMA and WINTAX.

- SYSMA for Sysma Projects and Tables upload, communication in live as well as calibrations.
- WINTAX for data acquisition download and analysis.

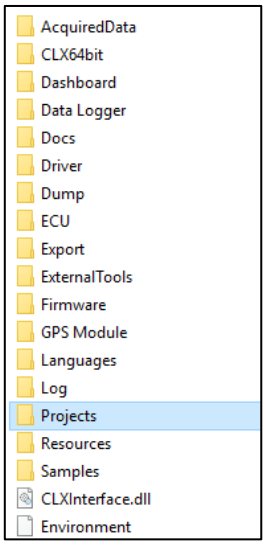
Communication Line

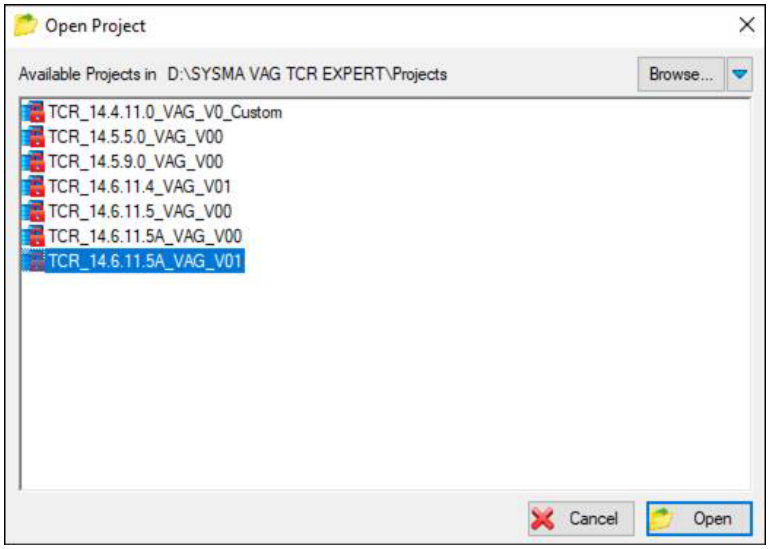
By default, ECU "**project**" is setup to communicate with ETHERNET LINE.

To connect to the car, the Ethernet IP address should be fixed to 192.168.1.xxx (last three xxx values should be between 0 and 253) and the subnet mask 255.255.255.0

How do you open a new Sysma Project?

1. You need to find the directory of the SYSMA installation. Usually: C:\ Program Files \SYSMA
2. Open the folder Projects and copy there the new SYSMA project previously uncompressed.
3. Open SYSMA, go to FILE > OPEN PROJECT and choose from the list the new project version.



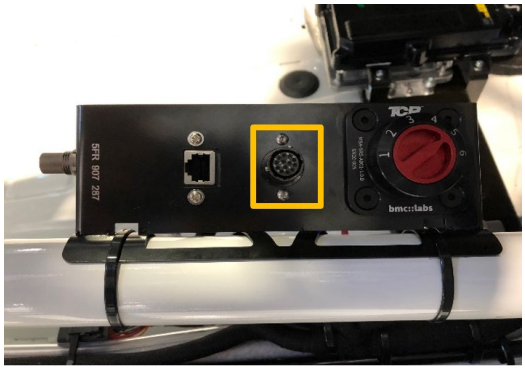


Now, you are ready to update the ECU of the car. The next slides will explain how to do it.

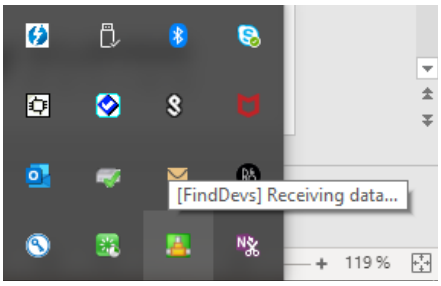
ECU Firmware update

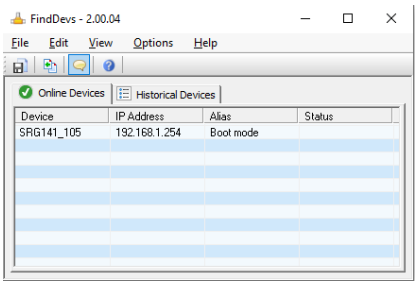
Follow the next steps to update the firmware:

1. With the car completely off, connect the CAN/Peak-CAN interface to the Diagnostics connector. Make sure the interface switch is in ON position.



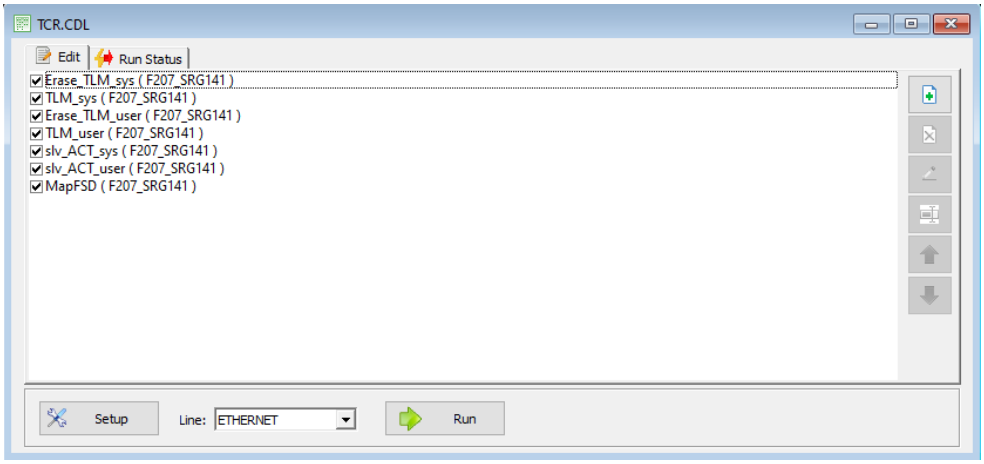
2. Connect the ethernet cable between your laptop and the car.
3. Turn on the car (12V).
4. After 10s, check the app “Find Devs” if you detect the ECU with the alias “BOOT mode”.



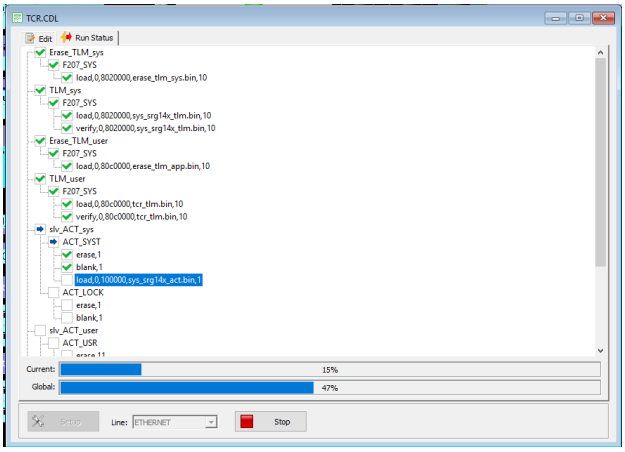


5. Open SYSMA

6. Double click on TCR.cdl
7. Click Run



8. Double click the device (IP)
9. Wait until the process is finished.



10. Close the window TCR.CDL
11. Turn off the car (12V OFF)
12. Move the switch toggle of the CAN/Peak-CAN interface cable to OFF position to exit the Boot mode.
13. Repeat steps 6, 7, 8, 9 and 10 with the file **fpga_141_conditional.cdl** in these two following cases:
    - **ECU is brand new** (spare part)
    - **ECU serial number from 500 onwards**

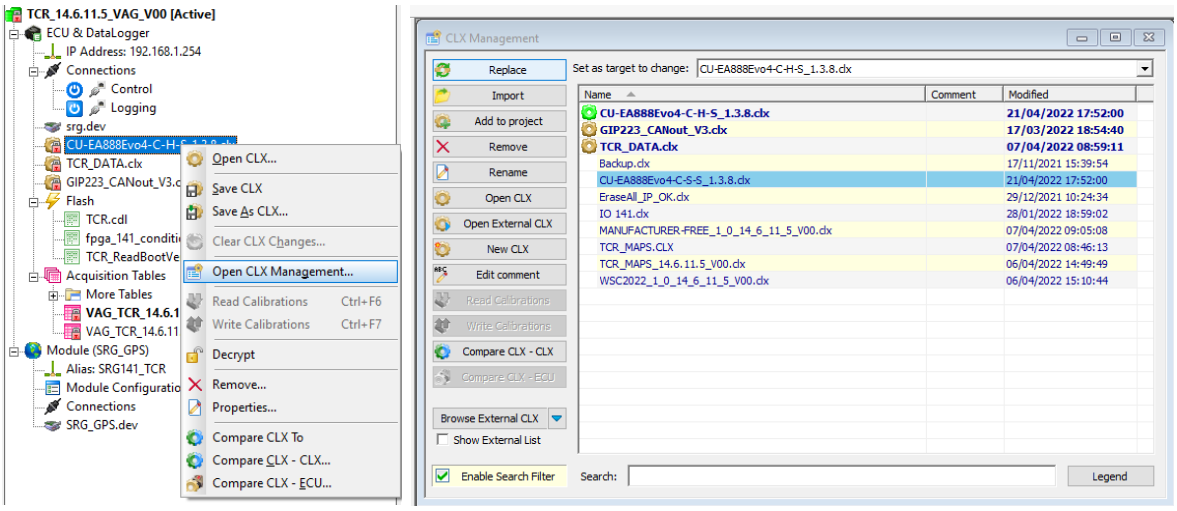
Note: If the **fpga** file is flashed out of these conditions, the process will be aborted because this additional process is not necessary.

ECU mapping & acquisition table update

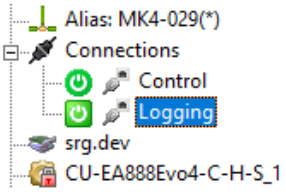
1. Turn on the car (12V ON)
2. Inside the project there are two different calibration files (.CLX). According to the gearbox that is mounted on the car (Hewland or Sadev) you have to choose one or the other file.
3. In Sysma, right click on “CU-EA888Evo4-C-H-S_x-x-x.clx” > Open CLX Management > Select the .clx file > click on Replace

   Hewland Gearbox ⟹ CU-EA888Evo4-C-**H**-S_x-x-x.clx

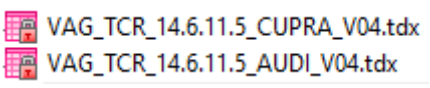
   Sadev Gearbox ⟹ CU-EA888Evo4-C-**S**-S_x-x-x.clx



4. Then, double click on Control and Logging, then you will see the indicators becoming green.



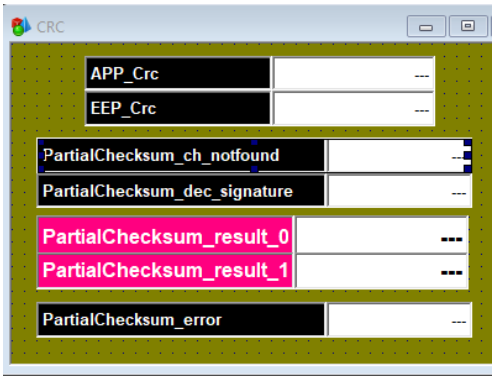
5. Right click on “CU-EA888Evo4-C-H-S_x-x-x.clx”
6. Click on Write Calibrations
7. To send the Acquisition table, right click on “VAG_TCR_14.X.X.X_CUPRA_V0x.TDX” or “VAG_TCR_14.X.X.X_AUDI_V0x.TDX”, according to the car brand



8. Click on Transmit table. Make sure the alias is matching your car’s chassis number
9. Power cycle the car before starting the engine (12V OFF → 12V ON)

   IMPORTANT! Make sure the partial checksums you see in the “System” layout of SYSMA are the ones published in the last bulletin.

Now you have ECU software updated with the last engine map and acquisition table.



Electrical calibrations (see User Manual Electric Electronics)

IMPORTANT: Calibrations are necessary when Firmware has been changed.

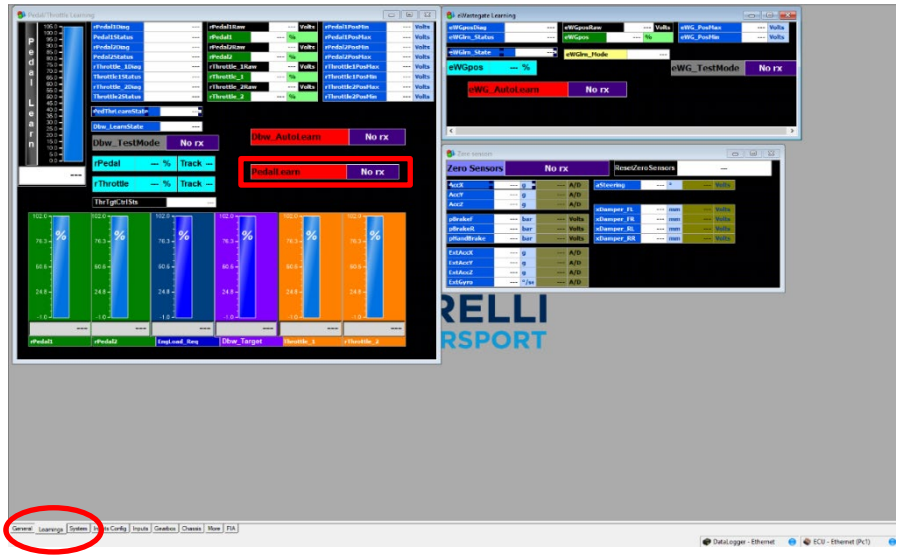
Every sensor of CUPRA/AUDI is calibrated and tested during the manufacturing process. However, if some components are replaced, a calibration is required. It consists in a quick process using SYSMA.

These common steps must be followed to start the calibration:

- Connect the Ethernet wire to the car and the computer.
- Switch on the power supply (green button in the console).
- Press the IGNITION button of the keypad.
- Open SYSMA with the proper project loaded.

A. Pedal Learning

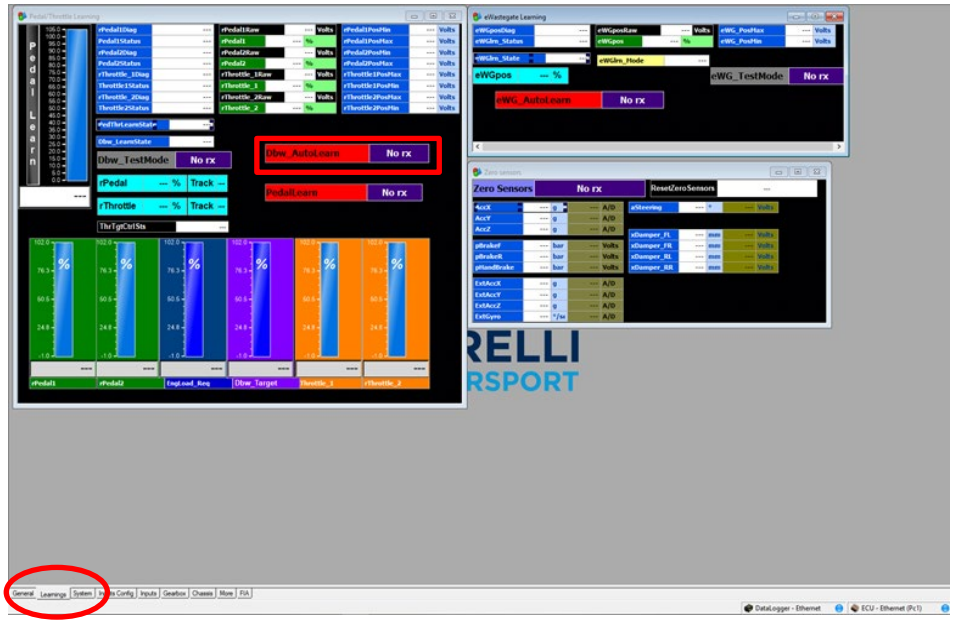
- Go to the “Learnings” tab.



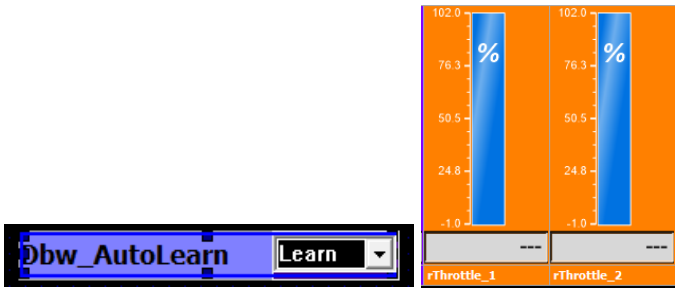
Do not press physically the pedal and select “min” in SYSMA. Then press the pedal 100% and select “max”.

B. Throttle autolearn

- Go to the “Learnings” tab.

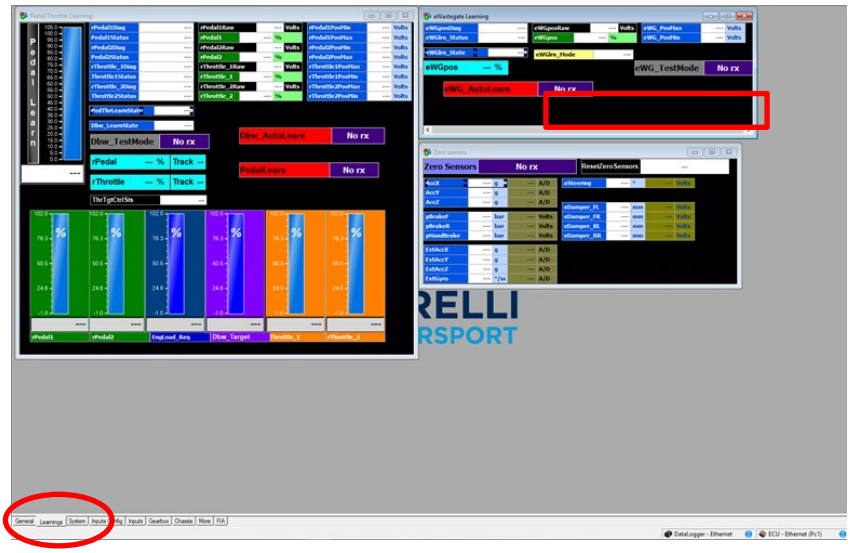


- Select the learn option and press out of the violet rectangle to initiate the auto learn process. You will observe the throttle bars going from 0- 100% automatically.

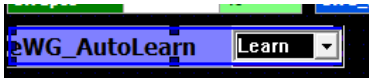


C. e-wastegate autolearn

- Go to the “Learnings” tab



- Select the learn option and press out of the violet rectangle to initiate the auto learn process. You will observe the wastegate status going from 0- 100% automatically.

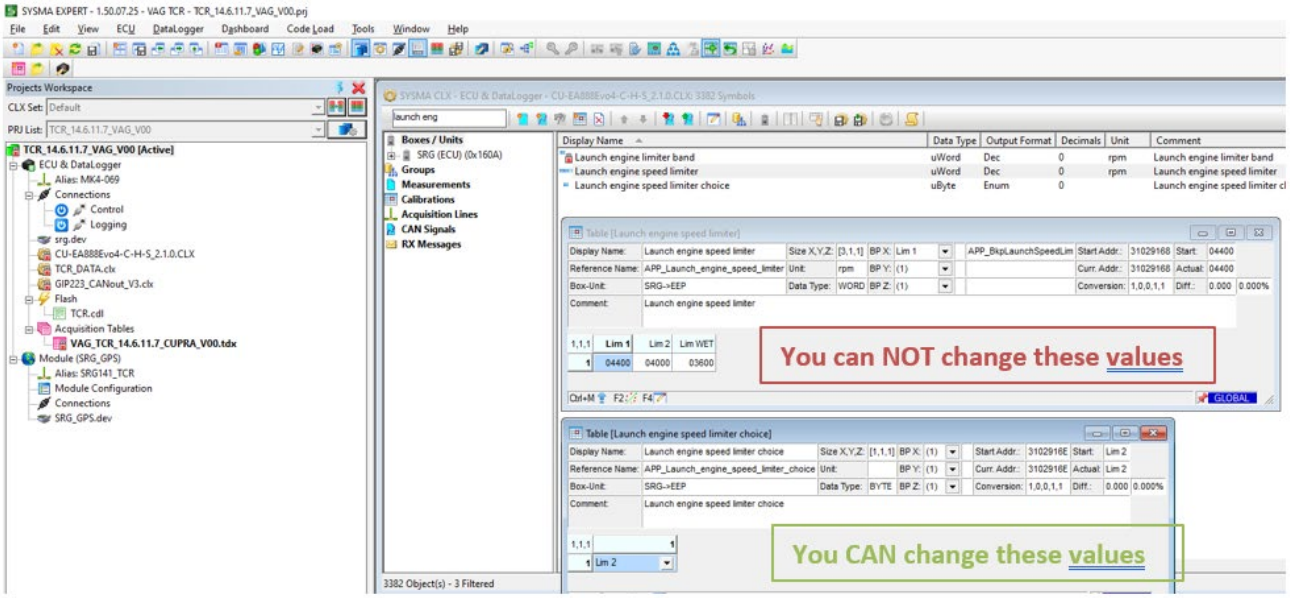


IMPORTANT: After all the calibrations are done, the car must be completely power cycled (KL30).

4 LAUNCH ENGINE SPEED LIMITER CHOICE

From now on (June 2024) there are only three launch speed limiters available: 4400, 4000 and 3600 rpm (default 4000rpm)

To change between them, you must open the .clx file and look for the parameter **Launch engine speed limiter choice.**



You can select Lim1, Lim2 or Lim WET which correspond to the three values mentioned above (4400, 4000 and 3600 rpm).

If at any time you would like to check the corresponding rpm limiter value table, you can open the parameter **Launch engine speed limiter.**

Once you choose your preferred value, right click on the parameter, and click on Write selected calibration to send the value to the ECU.

IMPORTANT: It is not allowed to modify the provided values of the parameter **Launch engine speed limiter**, changing this table will change the checksum.

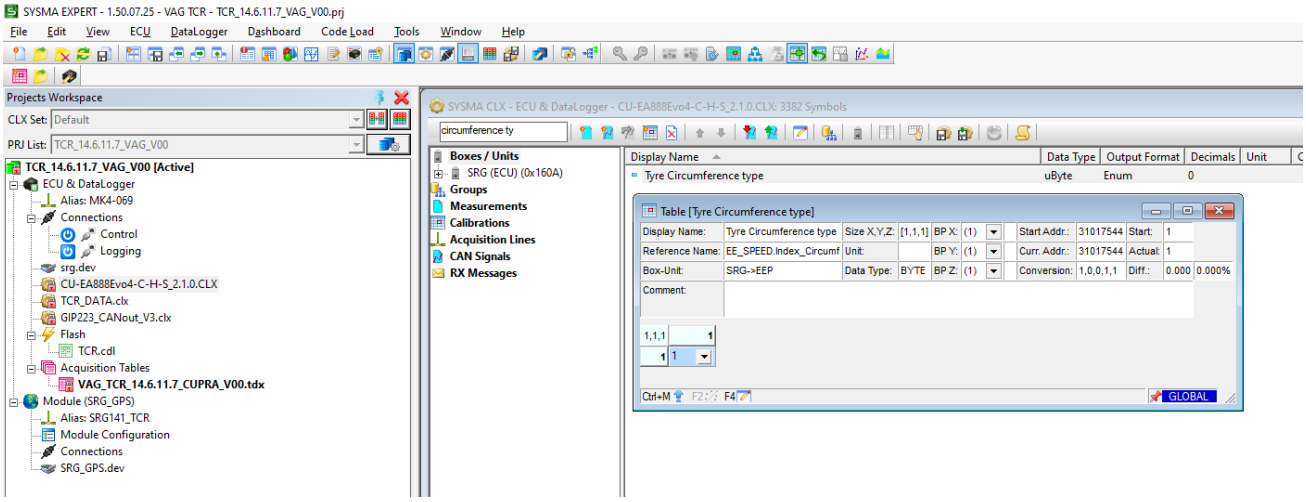
5 TYRE CIRCUMFERENCE CHOICE

Due to the different tyres, with different diameters, used in TCR championships, we advise you to adjust the tyre circumference to match the wheel speeds and the GPS speed. This will improve the data analysis and will help the ECU to adjust better Pit and FCY limiters.

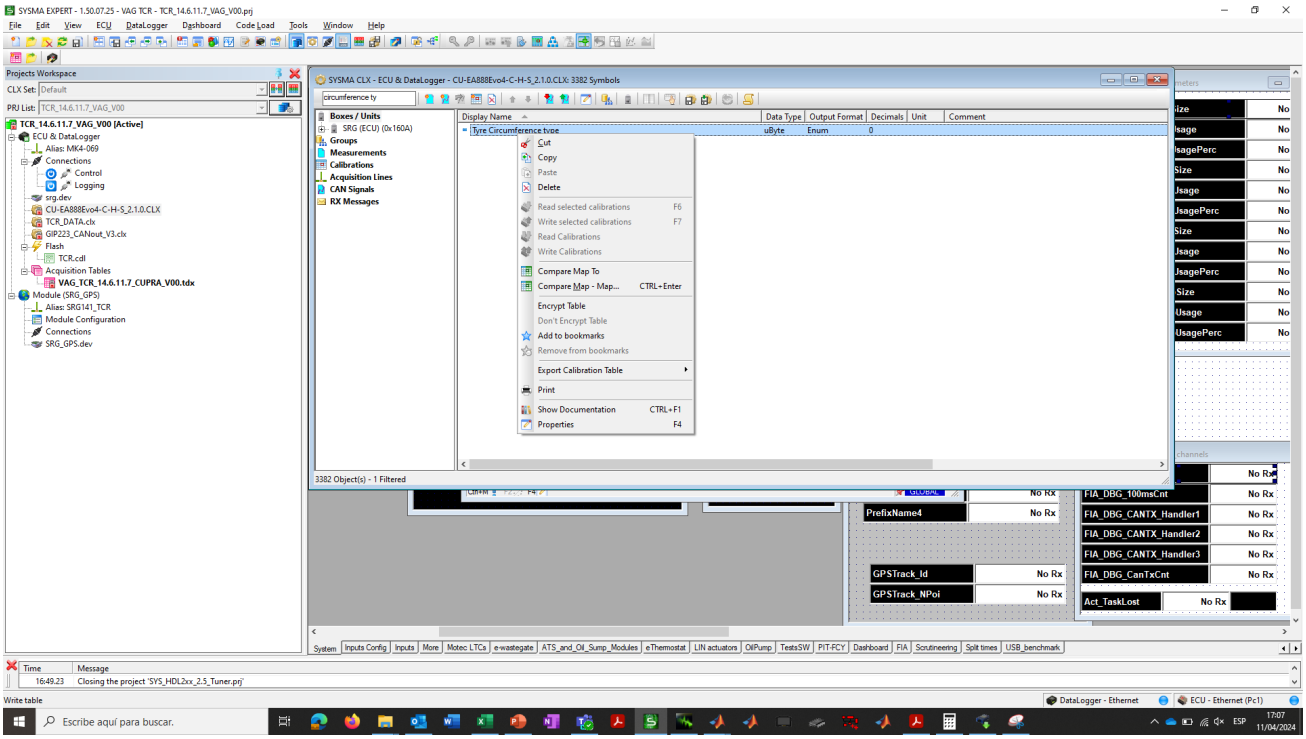
To do it, you must open the .clx file and look for the parameter **Tyre Circumference Type.**

The table below shows which value corresponds to each tyre manufacturer. Default value is 1 that corresponds to Kumho tyres.

Tyre Circumference Type		
1	Kuhmo	2100
2	Hankook	2050
3	Pirelli	2090
4	Michelin	2020
5	Yokohama	2040
6	Goodyear	2035
7	Dunlop	2035



Once you choose your preferred value, right click on the parameter and click on Write selected calibration to send the value to the ECU.


SYSMA EXPERT - 1.50.07.25 - VAG TCR - TCR_14.6.11.7_VAG_V00.prj
File Edit View ECU DataLogger Dashboard Code Load Tools Window Help
Projects Workspace
CLX Set: Default
PRJ List: TCR_14.6.11.7_VAG_V00
TCR_14.6.11.7_VAG_V00 [Active]
ECU & DataLogger
Alias: MK4-069
Connections
Control
Logging
srg.dev
CU-EA888Evo4-C-H-S_2.1.0.CLX
TCR_DATA.clx
GP223_CANout_V3.clx
Flash
TCR.cdl
Acquisition Tables
VAG_TCR_14.6.11.7_CUPRA_V00.tdx
Module (SRG_GPS)
Alias: SRG141_TCR
Module Configuration
Connections
SRG_GPS.dev
SYSMA CLX - ECU & DataLogger - CU-EA888Evo4-C-H-S_2.1.0.CLX: 3382 Symbols
circumference ty
Boxes / Units
SRG (ECU) (0x160A)
Groups
Measurements
Calibrations
Acquisition Lines
CAN Signals
RX Messages
Display Name
Data Type
Output Format
Decimals
Unit
Comment
Tyre Circumference type
uByte
Enum
0
Cut
Copy
Paste
Delete
Read selected calibrations F6
Write selected calibrations F7
Read Calibrations
Write Calibrations
Compare Map To
Compare Map - Map... CTRL+Enter
Encrypt Table
Don't Encrypt Table
Add to bookmarks
Remove from bookmarks
Export Calibration Table
Print
Show Documentation CTRL+F1
Properties F4
3382 Object(s) - 1 Filtered
PrefixName4
No Rx
GPSTrack_Id
GPSTrack_NPoi
FIA_DBG_100msCnt
FIA_DBG_CANTX_Handler1
FIA_DBG_CANTX_Handler2
FIA_DBG_CANTX_Handler3
FIA_DBG_CanTxCnt
Act_TaskLost
System Inputs Config Inputs More Motec LTCs e-wastegate ATS_and_Oil_Sump_Modules eThermostat LIN actuators OilPump TestsSW PIT-FCY Dashboard FIA Scrutineering Split times USB_benchmark
Time Message
16:49.23 Closing the project 'SYS_HDL2xx_2.5_Tuner.prj'
Write table
DataLogger - Ethernet
ECU - Ethernet (Pc1)
Escribe aquí para buscar.
ESP
17:07
11/04/2024

6 ADU DISPLAY (advanced display unit)

Find all information about how to operate with the configuration and layouts characteristics of the ADU in the "ADU_EcuMaster User Manual", available on the platform.

Two ADU display models are existing, 5 and 7 inch. Here below you will find a quick guide for installation and operations with the ADU device.

SW Installation

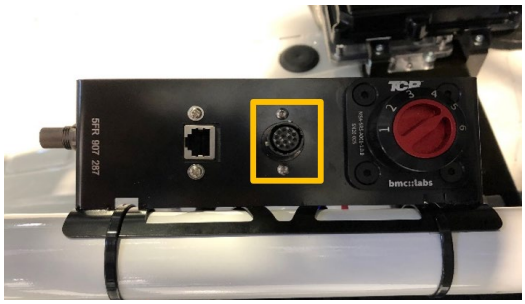
Using the files on the .zip folder downloaded, install in your laptop the ECUMaster ADU software like following:

1. ADUSetup_72_0_VAGTCR.exe for 5" ADU
2. ADUSetup_78_0_VAGTCR.exe for 5" & 7" ADU
   **Updated versions might be available on the VAG motorsport portal.*

How to connect the laptop to the ADU

1. Use the CAN/Peak-CAN interface tools:
   a. **USBtoCAN interface**
   b. **Laptop-tool + PEAK CAN interface:** You must select the third position on the rotary switch (System cockpit Display).

2. With the car completely off, connect the interface to the Diagnostic connector.



3. Switch ON the car with the Main button (12V).
4. Open **EcuMaster ADU7 VAGTCR** software and select one of the templates shown.
5. If you want to open a different project, click on File > Open Project and select the desired one.

6. Once the Project file is open, click on File > Make Permanent.
7. Disconnect the interface from the Diagnostic connector and make a power cycle.

IMPORTANT: All processes explained in this technical note are also explained on the User manual Electric Electronics as well as in the Marelli Wintax or Sysma User Manual. Please, read and use them.

7 GPS MODULE & ANTENNA

There are two GPS antenna modules installed on the VAG TCR cars models:

- GPStoCAN module for Audi RS3 LMS TCR and CUPRA LEON Competicion, corresponding to 5" display.
- GPStoCAN_V2 module for **all car models,** including LEON VZ TCR, corresponding to 7" display.

SW Installation

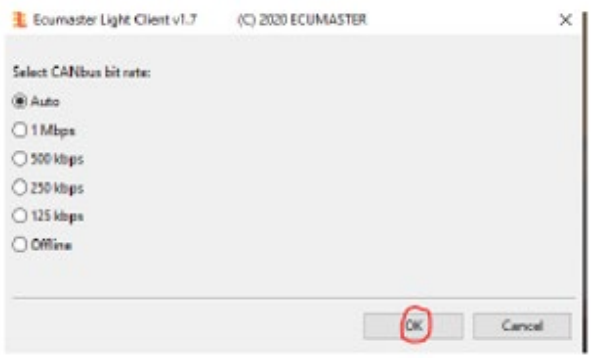
Download and install the Software **LightClientSetup_2_0.exe** and **gps2__fw4_0.bin** file for any operation or update of the GPS module or antenna.

GPS module update process

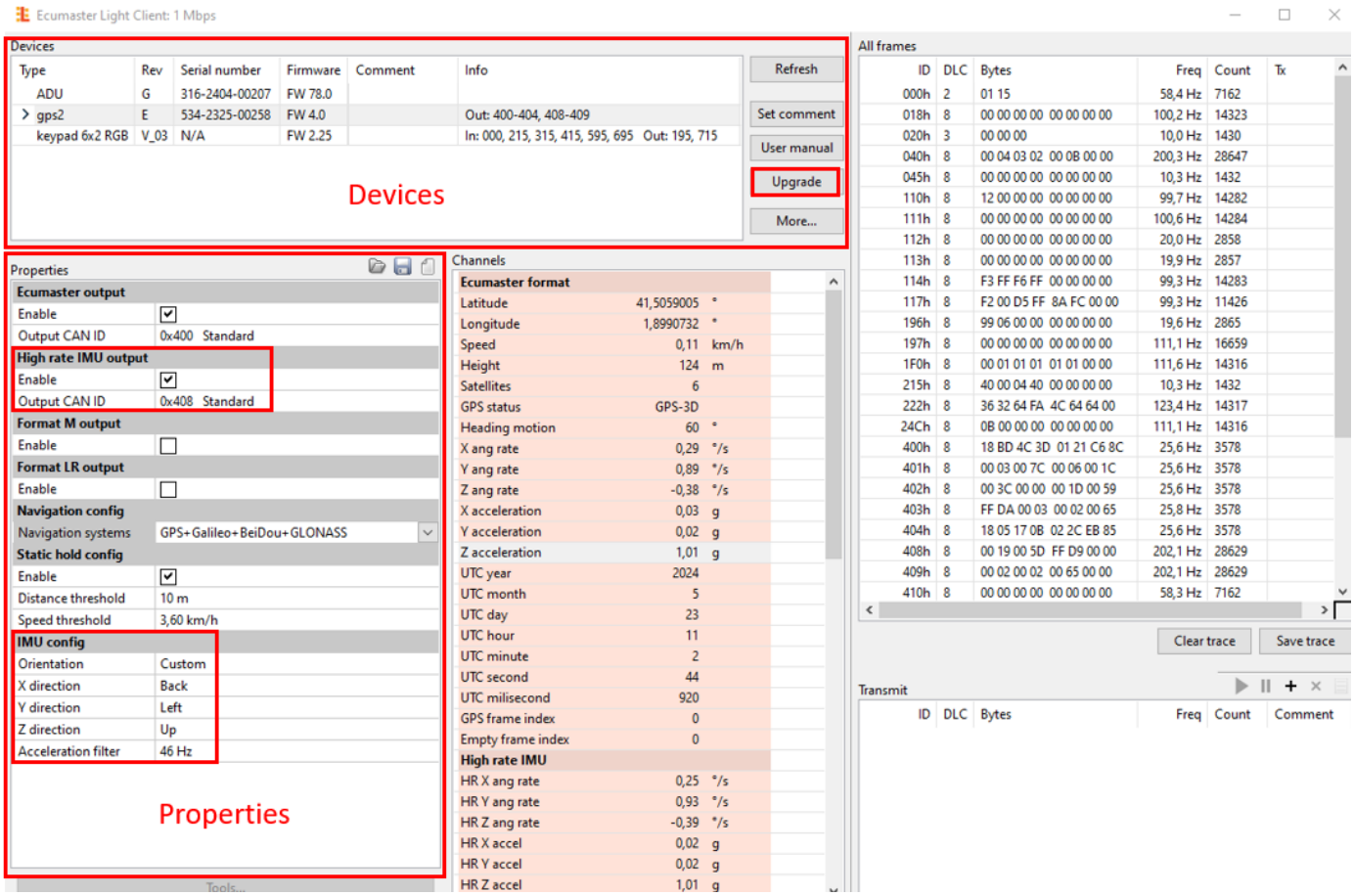
1. Install **LightClientSetup_2_0.exe** in your computer.
2. Connect the display CAN interface or the Peak Can Interface to the diagnostic connector and switch on Main Power supply.
3. Open the LightClient Software and choose "**auto**" as CAN bit rate.
4. In the Devices zone, choose the **gps2** module. Double click on it.
5. Click on the Upgrade button and select the file "**gps2__fw4_0.bin**"
6. Wait until the firmware update is done.
7. In the properties zone, activate the "**High rate IMU output**" square box. Then select the ID number **0x408 Standard** on the "Output CAN ID".
8. On the IMU config box, select the orientation "**Custom**" and change the orientation of the three axis X (**Back**), Y (**Left**) and Z (**Up**).

IMPORTANT: If a v1 GPS module (Audi RS3_LMS or CUPRA Leon Competición with 5" ADU display) is updated with this FW, the GPS may not work properly

(.3) LightClient Software and choose “**auto**” as CAN bit rate



(.4,5,6,7,8)



Wintax properties:

After doing the GPS module FW update, a new **FFT Low pass** filter at **20Hz** on the **G_X**, **G_Y** and **G_Z** channels must be activated on Wintax, as shown below on the Graph Properties window:

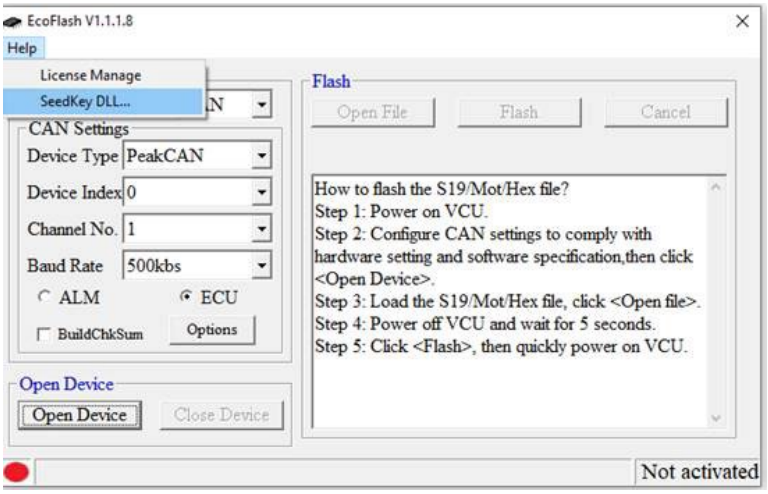
8 GATEWAY

Gateway device has the function of router for the different CAN-BUS and LIN-BUS lines and in addition to controlling other series components such as car lights or wiper.

This device does not usually have updates, but sometimes it does. For this reason, access to this component is temporary and through a license when this occurs. Below we explain the procedure to acquire the license and update the GTW SW.

How to proceed with SW update on the Gateway.

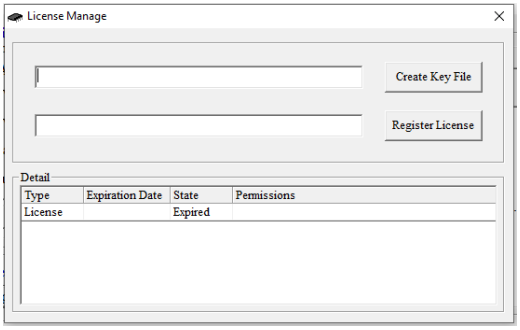
1. Download Ecotron_Gateway.zip folder from the Projects & Software folder at the Download Area on the Online Platform.
2. Uncompress the zip folder. You will find three files inside (EcoFlash_setup.exe, PG_Default.dll and the .mot file that will be flashed)
3. Install EcoFlash software on your PC using EcoFlash_setup.exe
4. The first time EcoFlash is opened, you will need to upload the .dll file. Click on Help > SeedKey DLL and open the PG_Default.dll file.



How to purchase and activate the SW license

1. To purchase the EcoFlash license (PC based 1 month), you will need to contact Ecotron (USA) through the following email support@ecotron.ai. The license has a cost ($) and it will be active for 1 month since the moment it is given, so be sure you can have access to the car to be able to update the gateway. This cost could be updated yearly by Ecotron company.
2. Ecotron will request your company data and your Key File.
3. You can generate the Key File by going to Help > License Manager > Create Key File. IMPORTANT: provide the Key File of the specific computer you will use for EcoFlash. The licence will only work on that computer.

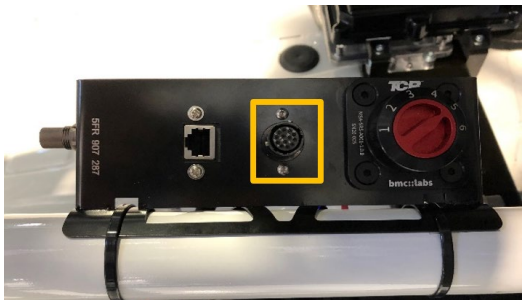
4. With this information, Ecotron will send you a proforma invoice to be paid and when they receive the payment, they will send you the License file to be registered on the License Manager, by selecting the .lic file after clicking on the Register License button.



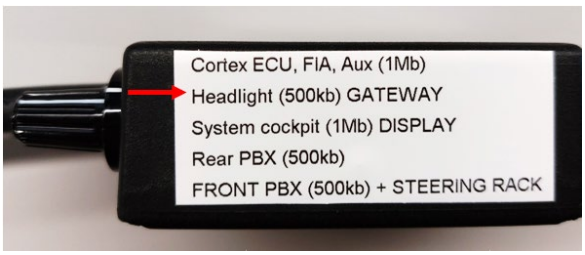
How you can use EcoFlash software to update your gateway:

The process is simple, follow the next steps:

1. Connect the PCAN-USB device with the Laptop Tool (CAN Interface).
2. Connect the USB connector at the PCAN-USB to any USB port on the laptop and the Deutsch connector from the Laptop Tool to the car.



3. Select the rotary switch on the Laptop Tool at the second position (GATEWAY) and check the Boot switch is not activated.



4. Open the EcoFlash software, select Open Device and Open File (select the file .mot sent).
5. The car must be completely powered off.
6. Click flash on the program.

7. Immediately, push the ON button of the car and hold on (keep the finger pushing on the button during the flashing time)
8. You will see a progress bar in EcoFlash. (approx. 2 minutes)
9. Once it is finished successfully, you can release the ON button and the update process is finished.

How to setup your car configuration:

If the gateway will work on an **Audi RS3 LMS TCR** or a **CUPRA Leon Competición**, it is not needed to do any other action. It will automatically recognise the car and will adapt by itself.

If the gateway will work on a **CUPRA Leon VZ TCR**, after finishing the flashing process, you have to press together and hold the rain lights and windscreen heater buttons and then click on Main OFF switch (marked in Red colour). Then, the electronics car setup will change.