Audi Sport
customer racing

Audi RS 3 LMS

ELECTRIC & ELECTRONICS MANUAL V7

This document provides the main guidelines to handle electrically the Audi RS 3 LMS. Harness diagrams, display customization, diagnostics tools, data acquisition and calibration are some of the topics covered in this manual.

Audi Sport
customer racing

TABLE OF CONTENTS

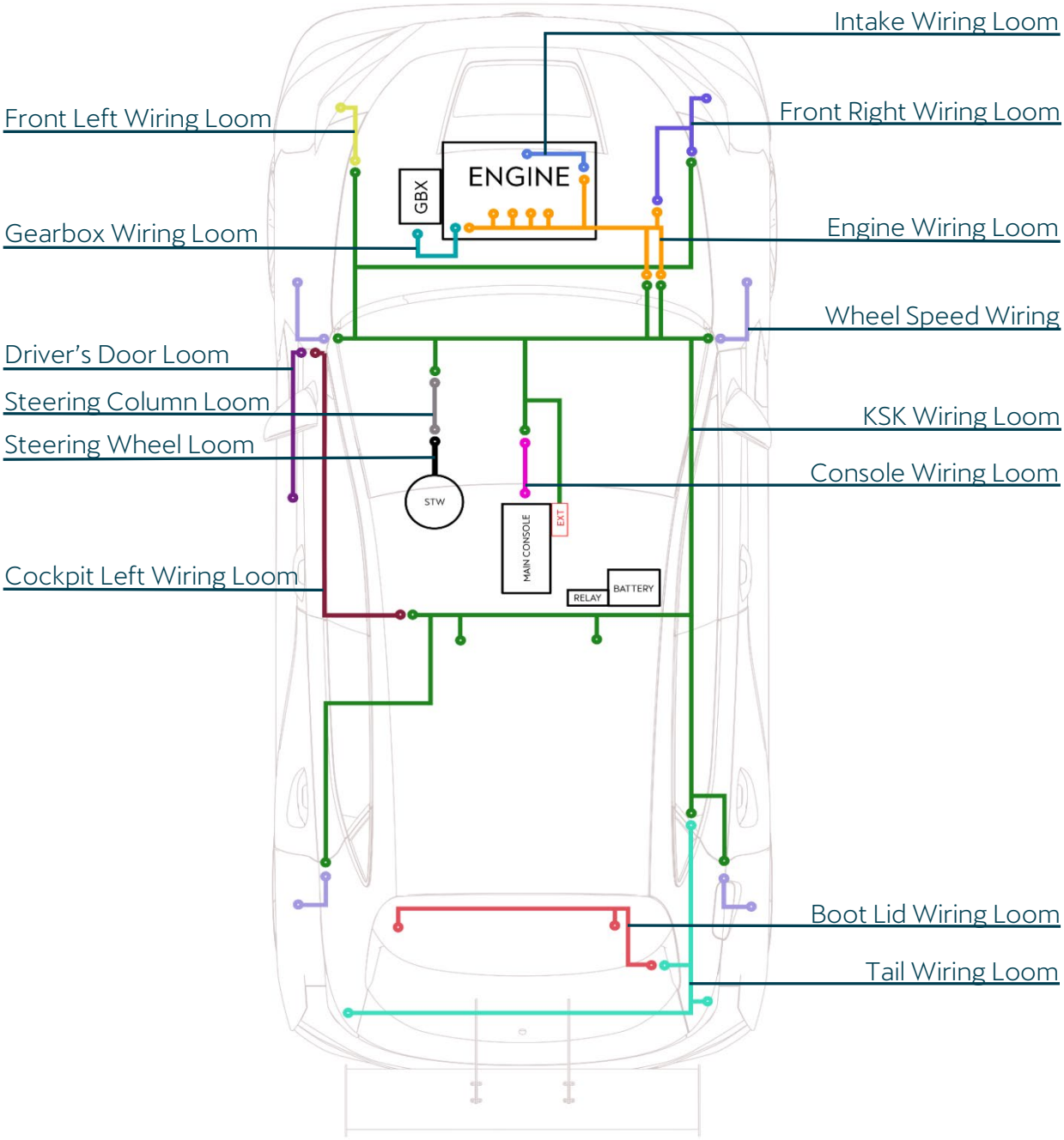
1. ELECTRICAL STRUCTURE 3
   1.1. VEHICLE WIRING LOOMS 3
      1.1.1. CONECTORS' DIAGRAM 4
      1.1.2. AUXILIARY CONNECTORS 6
   1.2. MOTOR HARNESS & DEVICES 11
      1.2.1. CONECTORS' DIAGRAM 11
   1.3. POWER HARNESS 12
   1.4. ELECTRICAL DEVICES 13
2. VEHICLE INTERACTION & TOOLS 14
3. DATA ACQUISITION 16
   3.1. VAG SYSMA 17
      3.1.1. LAUNCH LIMITER SETUP 19
      3.1.2. TIRE CIRCUMPHERENCE SETUP 20
   3.2. VAG WINTAX 22
4. LOGGING OPERATING VALUES 24
5. ELECTRICAL CALIBRATIONS 26
   5.1. PEDAL LEARNING 27
   5.2. THROTTLE AUTOLEARN 28
   5.3. E-WASTEGATE AUTOLEARN 29
6. DRIVER DISPLAY 30
   6.1. CUSTOMIZATION 32
      6.1.1. SHIFTLIGHTS 32
      6.1.2. PAGE LAYOUTS 32
      6.1.3. ALARMS 35
      6.1.4. TRACK GPS LAP TRIGGERING 37
      6.1.5. EDIT SPECIFIC TRACK 38
      6.1.6. ADDING A NEW POI 39
      6.1.7. RESET TRACK DATA 40
      6.1.8. GPS ANTENA 41
   6.2. FUEL LEVEL DISPLAY 42
   6.3. POWERBOX MONITORING DIAGNOSIS 44
   44

6.4. SCRUTINEERING DISPLAY 47
6.5. NEW BRAKE PADS DISPLAY 47
7. GATEWAY 48
8. FIRE EXTINGUISHER 51
9. ABS (OPTIONAL KIT) 53
10. RACELOGIC VIDEO CAMERA **(OPTIONAL KIT)** 54
11. CHANGE INDEX 55

1. ELECTRICAL STRUCTURE

This chapter will expose the electrical architecture of the vehicle, its connectors and the auxiliary connectors that the team may use.

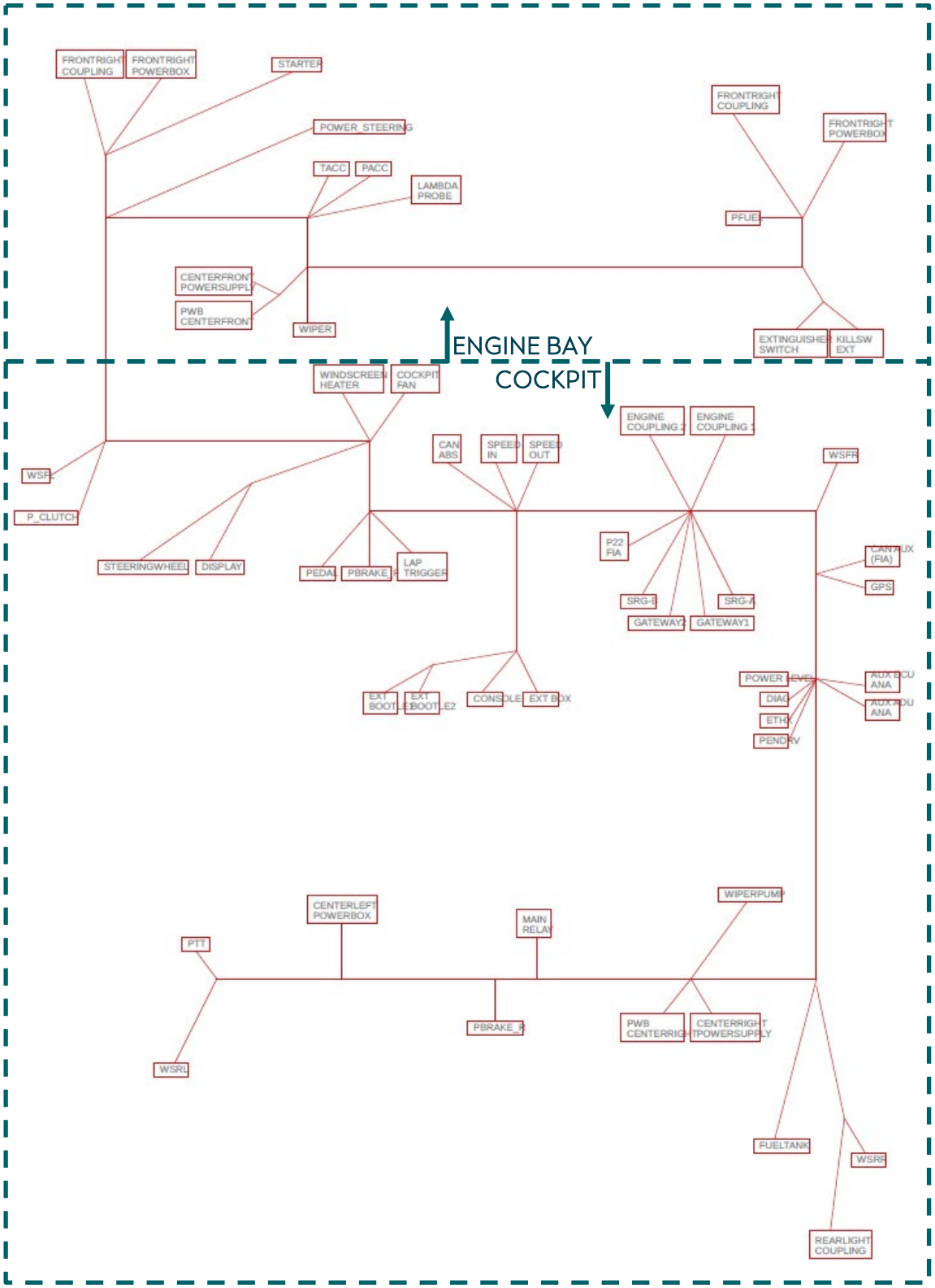
1.1. VEHICLE WIRING LOOMS

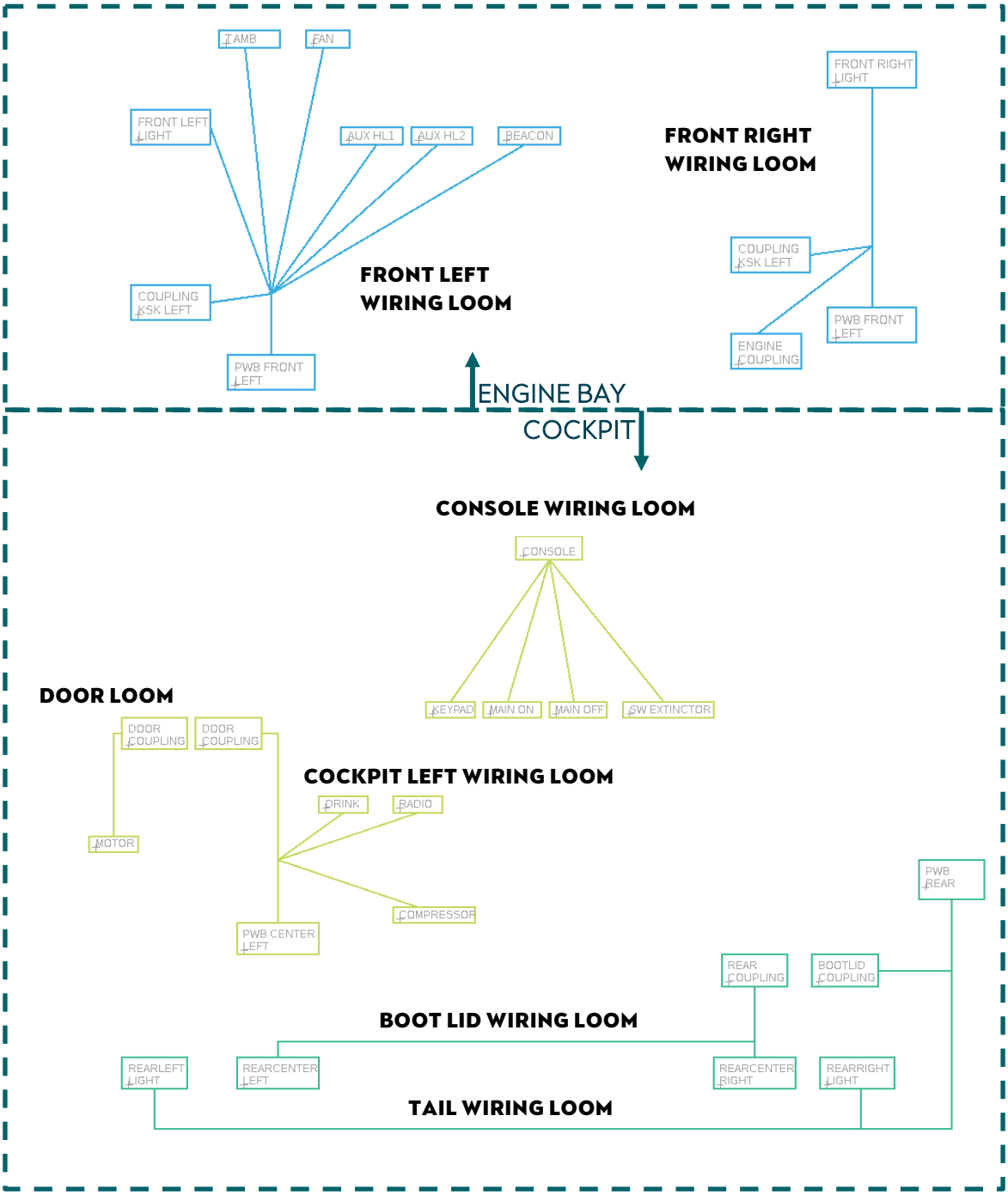


1.1.1. CONECTORS' DIAGRAM

The following figures shows the connectors' layout of the different wiring looms present in the vehicle.

KSK WIRING LOOM



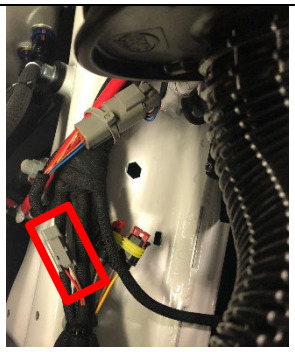


Audi Sport
customer racing

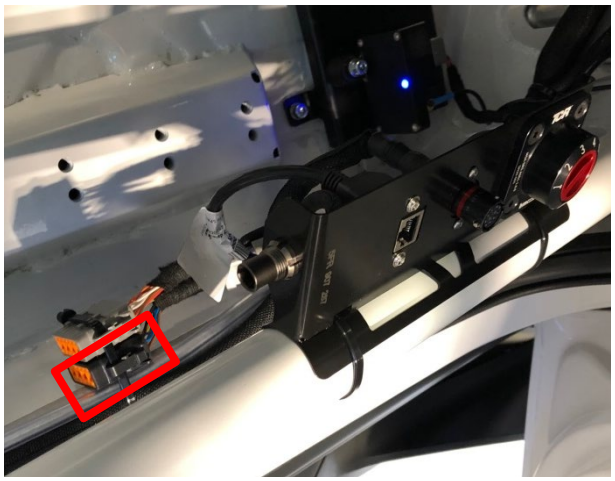
1.1.2. AUXILIARY CONNECTORS

The main loom of the car is prepared for connecting auxiliary devices that the teams may need. The name and pinout of the connectors are listed below. In order to know the location of the connector check out the previous section.

TRANSPONDER

Function		To connect a transponder
Mating connector		DTM04-2P
Pin Out		
1	KL30 (12V)	
2	GND	

AUX ADU ANA

Function		To connect additional analogue sensors Configuration required (Display & ECU)
Mating connector		DTM04-12PB
Pin Out		
1	ANA SIGNAL 1	
2	ANA SIGNAL 2	
3	ANA SIGNAL 3	
4	ANA SIGNAL 4	
5	ANA SIGNAL 5	
6	ANA SIGNAL 6	
7	ANA SIGNAL 7	
8	ANA SIGNAL 8	
9	5V SUPPLY	
10	AGND	
11	12V SUPPLY	

12	GND	

A U X E C U A N A

Function		To connect additional analogue sensors Configuration required (ECU, with SYSMA) Recommended for dampers' potentiometers
Mating connector		DTM04-12P
Pin Out		
1	ANA SIGNAL 10	
2	ANA SIGNAL 14	
3	ANA SIGNAL 15	
4	ANA SIGNAL 16	
5	--	
6	--	
7	CAN 0 HIGH	
8	CAN 0 LOW	
9	5V SUPPLY	
10	AGND	
11	12V SUPPLY	
12	GND	

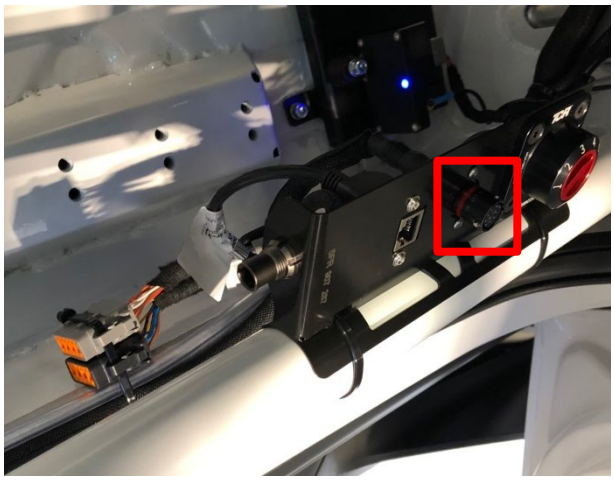
C A N A U X (F I A)

Function		USE FOR WTCR CARS ONLY To connect FIA's logger
Mating connector		DTM04-6P
Pin Out		
1	12V SUPPLY	
2	GND	
3	CAN 0 HIGH	
4	CAN 0 LOW	

D I A G

Function	Diagnostic connector used for connecting the computer to the display and gateway
Mating connector	AS6-10-35-PN
Pin Out	

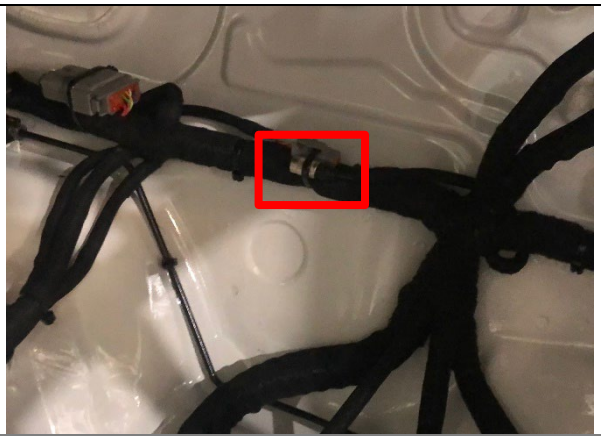
1	
2	
3	CAN 1 HIGH
4	CAN 1 LOW
5	CAN 2 HIGH
6	CAN 2 LOW
7	--
8	--
9	--
10	--
11	--
12	12V SUPPLY
13	GND



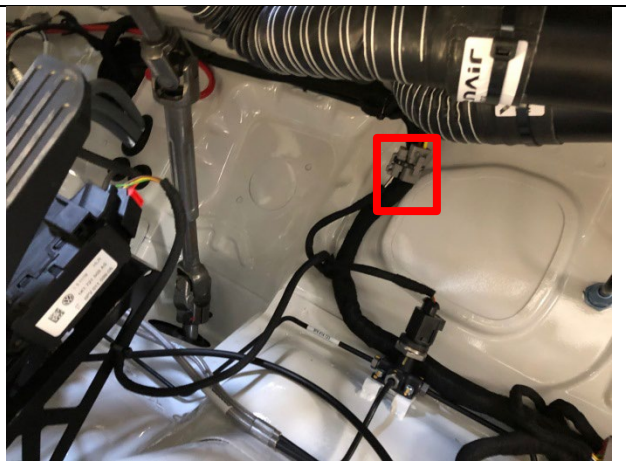
P 2 2 F I A

Function	USE FOR WTCR CARS ONLY To connect FIA's pressure sensor
Mating connector	Binder
Pin Out	

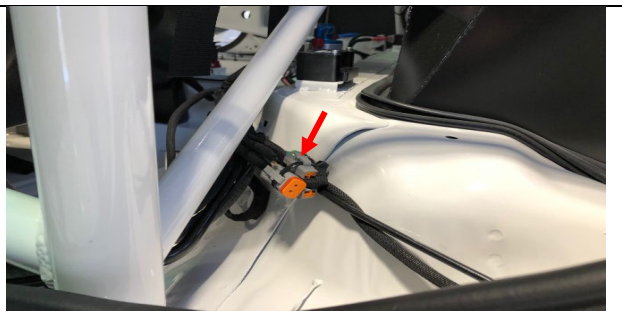
1	SIGNAL
2	AGND
3	12V SUPPLY



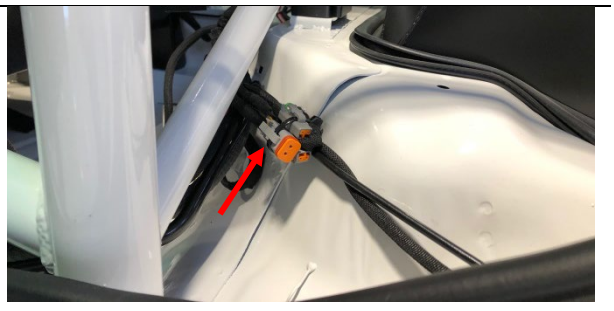
WINDSCREEN HEATER

Function		To connect a windscreen heater
Mating connector		DTP04-2P
Pin Out		
1	12V SUPPLY (yellow)	
2	GND (brown)	

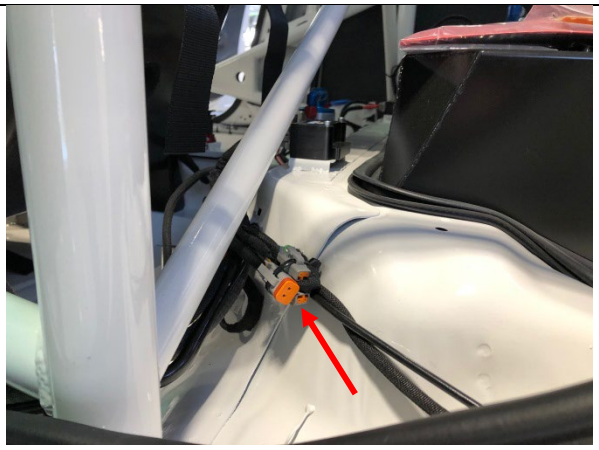
PTT (PUSH TO TALK)

Function		To connect team's radio (PTT)
Mating connector		DTM04-2P
Pin Out		
1	PTT1 (Green)	
2	PTT2 (Black)	

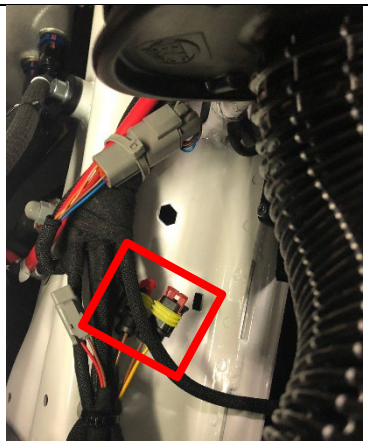
RADIO (POWER SUPPLY)

Function		To connect team's radio (PTT)
Loom		Cockpit Left
Mating connector		DT04-2P
Pin Out		
1	12V SUPPLY (yellow)	
2	GND (brown)	

D R I N K

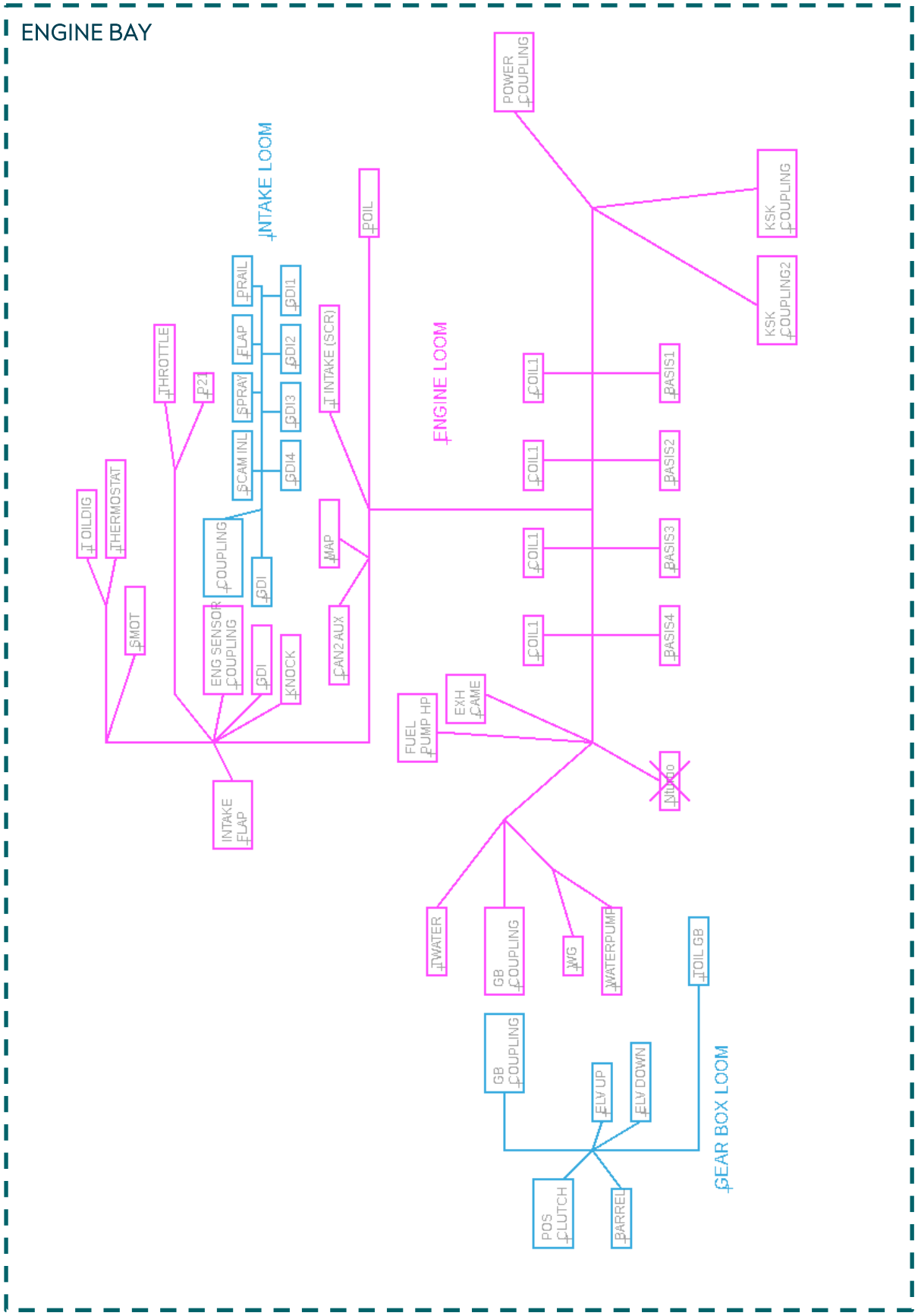
Function		To connect driver's drink device
Loom		Cockpit Left
Mating connector		DTM04-2P
Pin Out		
1	12V SUPPLY (green)	
2	GND (brown)	

A U X H L 1

Function		To connect auxiliary headlight 1 &2
Loom		Front Left
Mating connector		AMP Superseal 1.5
Pin Out		
1	GND	
2	12V SUPPLY	

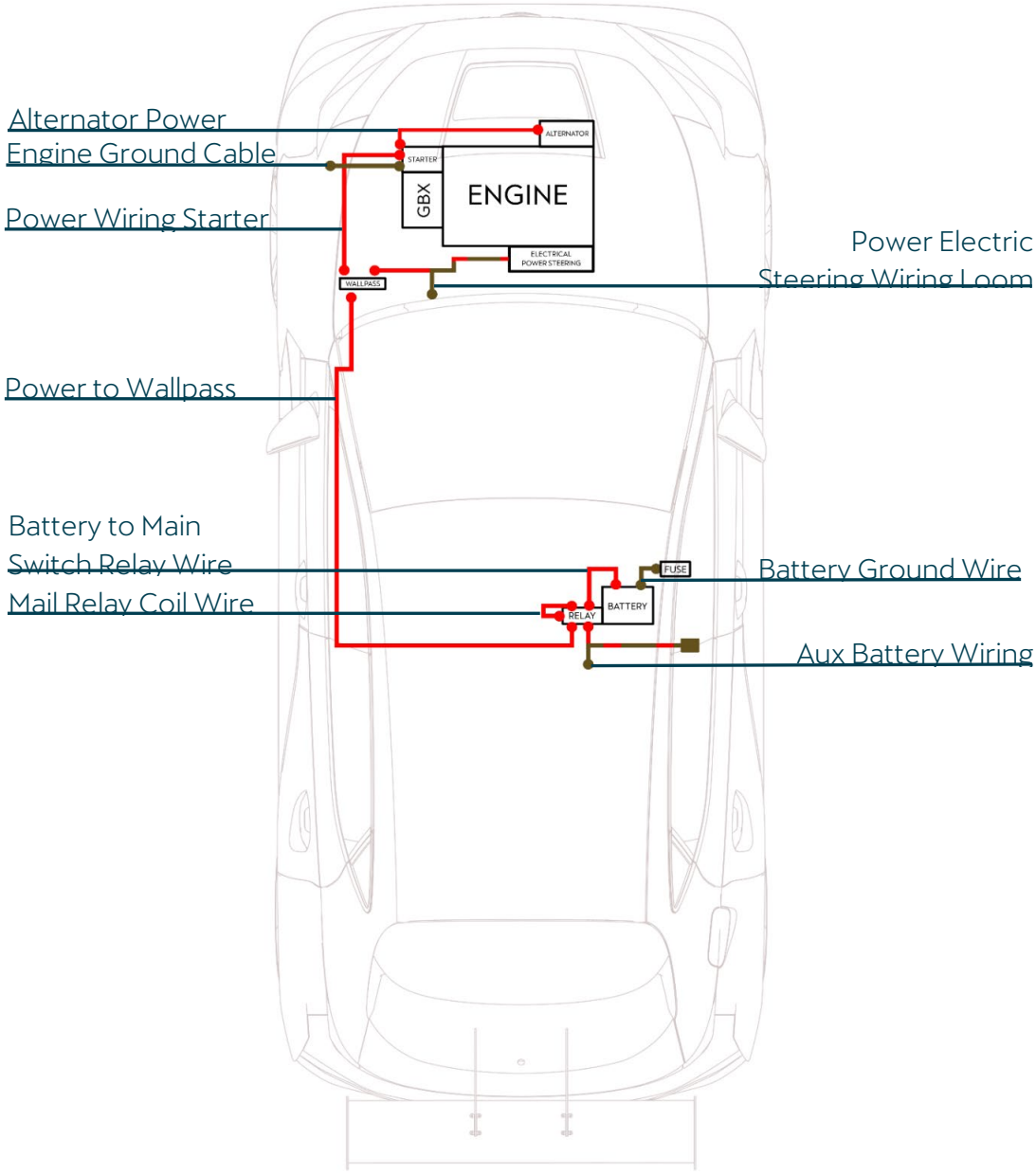
1.2. MOTOR HARNESS & DEVICES

1.2.1. CONECTORS' DIAGRAM



Audi Sport
customer racing

1.3. POWER HARNESS

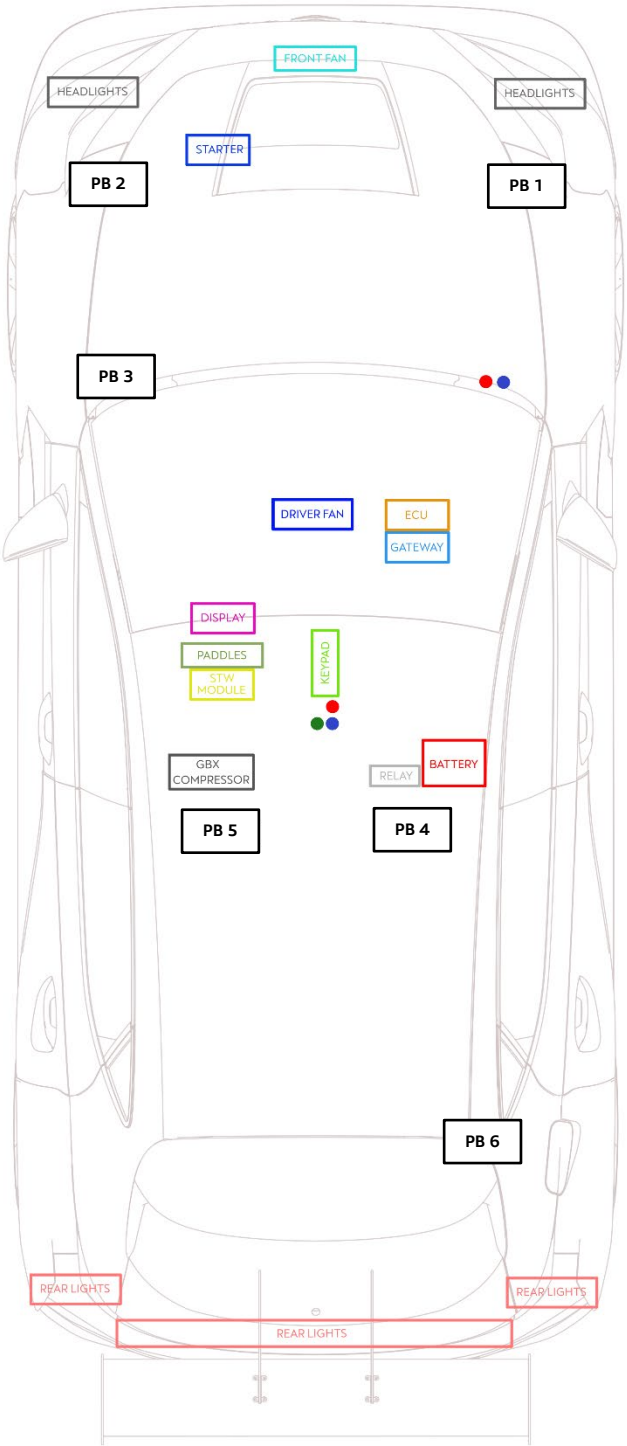


IMPORTANT: A fuse of 25 Amp is placed on the battery. The amperage value and position must be respect.

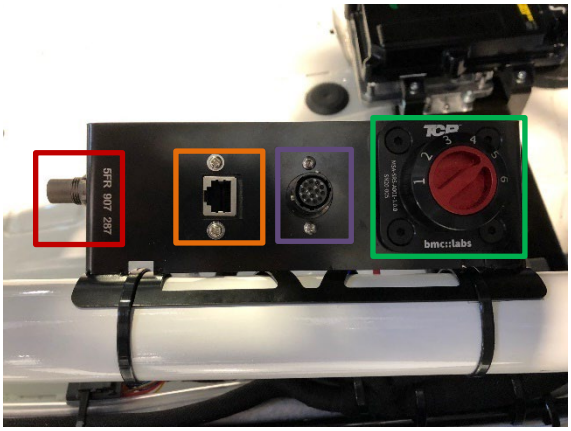
Its subject of certification of the car !

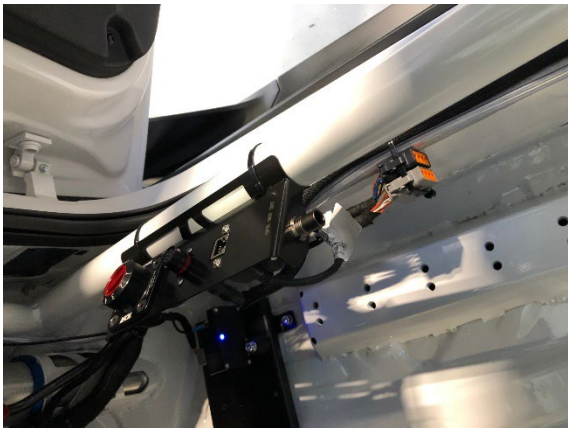
1.4. ELECTRICAL DEVICES

Regarding the power supply distribution, the Audi RS 3 LMS has a modular architecture of six powerboxes (PB) distributed in the car that protect the different electrical devices.



2. VEHICLE INTERACTION & TOOLS





CONNECTOR	FUNCTION
DIAG (CAN)	Audi Diagnosis port Teams will use it to interact with the display
Ethernet	Teams will use this port to interact with the ECU (SYSMA & WinTAX)
Power Level	The rotary determines the BOP level: 1 --> 90% 2 --> 92.5% 3 --> 95% 4 --> 97.5% 5 --> 100% 6 --> 102.5% **CAUTION.** Engine must be stopped to change the engine map
Fischer USB Drive	**SCRUTINEERING USE.** If the USB stick is connected, race data is stored in the device.

DEVICE	ECU	DISPLAY	GATEWAY
Software Required	SYSMA & WINTAX	ECUMASTER ADU	EcoFlash_Setup
Harness required	Ethernet	CAN Interface Peak CAN interface	CAN Interface Peak CAN interface
Functionalities	Engine and Gearbox manage Calibrate sensors Data storage	Driver display Alarms Tracks / GPS	Router
Additional sensors	Auxiliary connector +4 analogue inputs + CAN	Auxiliary connector +8 analogue inputs	

To interact with the devices of the Audi RS 3 LMS, a CAN Interface is required (see parts catalogue/Tools)

1. CAN-interface tooling (from 2020 to 2023)

2. Peak-CAN + interface (from 2024 onwards)

3. DATA ACQUISITION

The AUDI RS 3 LMS uses the ECU as the main data logger of the car. To setup the parameters to include in the logging such as names or acquisition frequencies it is necessary VAG SYSMA from Marelli. VAG WinTAX will be used to download the data to the computer and analyse it.

IMPORTANT. To connect your computer to the ECU, the power supply of the car must be switched on. IGNITION will be required for some functions.

By default, the following parameters are included in the data logging of a new AUDI RS 3 LMS Audi RS 3 LMS:

Display Name	Unit	Data Type	Format	Decimals	Frequency A	Elaboration	Comment
aLat	g	sWord	Dec	3	100Hz	Line	Accelerometer Y (lateral) hw compensated
aLon	g	sWord	Dec	3	100Hz	Line	Accelerometer X (longitudinal) hw compensated
aVer	g	sWord	Dec	3	100Hz	Line	Accelerometer Z (vertical) hw compensated
bAdvance	°crk	Float	Dec	1	100Hz	Line	Final ignition Advance
bAdvanceCyl1	°crk	sWord	Dec	1	100Hz	Line	Ignition advance cylinder 1
bAdvancePot	°crk	Float	Dec	1	100Hz	Line	Advance potentiometer
bGpsLatitude	°	sLong	Dec	7	10Hz	Line	
bGpsLongitude	°	sLong	Dec	7	10Hz	Line	
bInjection	°crk	Float	Dec	1	100Hz	Line	Main ramp injection phase 1 cylinder 1
bSteering	°	Float	Dec	1	100Hz	Line	Steering wheel angle elaborated value (filtered)
bVvtIn	°crk	Float	Dec	1	100Hz	Line	VVT1 real shifting
bVvtInTarget	°crk	Float	Dec	1	100Hz	Line	VVT1 shifting target
bVvtOut	°crk	Float	Dec	1	100Hz	Line	VVT2 real shifting
bVvtOutTarget	°crk	Float	Dec	1	100Hz	Line	VVT2 shifting target
crcAPP		uLong	Hex	0	2Hz	Line	Application software CRC
crcEEP		uLong	Hex	0	2Hz	Line	Calibration CRC
dInjection	µs	uWord	Dec	0	100Hz	Line	Main ramp injection time 1 cylinder 1
fRpmEng	rpm	uWord	Dec	0	100Hz	Line	Engine speed
mInjection	mg	uWord	Dec	2	100Hz	Line	Main ramp injection mass cylinder 1 for consumption
pAmbient	mbar	sWord	Dec	0	100Hz	Line	Barometric pressure elaborated value (filtered)
pBoost	mbar	sWord	Dec	0	100Hz	Line	Boost pressure (p2.1) value (filtered) before throttle valve
pBrakeF	bar	sWord	Dec	1	100Hz	Line	Front Brake pressure elaborated value (filtered)
pBrakeR	bar	sWord	Dec	1	100Hz	Line	Rear Brake pressure elaborated value (filtered)
pManifold	mbar	sWord	Dec	0	100Hz	Line	Inlet pressure (p2.2) value (filtered) after throttle valve
pManifoldScrut	mbar	sWord	Dec	0	100Hz	Line	Inlet pressure scrutineering value (filtered), TCR Sensor, after throttle valve
pManifoldTarget	mbar	Float	Dec	0	100Hz	Line	Inlet pressure (p2.2) target
posGear		sByte	Dec	0	100Hz	Line	Gear position from -1 (reverse) to max gear
pRail	bar	sWord	Dec	1	100Hz	Line	Fuel high pressure elaborated value (filtered)
rEngLoadRequest	%	uWord	Dec	1	100Hz	Line	Engine load request
rLambda	1	sWord	Dec	3	100Hz	Line	Lambda 1 in lambda
rPedal	%	sWord	Dec	1	100Hz	Line	Pedal position elaborated value
rThrottle	%	sWord	Dec	1	100Hz	Line	Throttle position elaborated value
staGear		uByte	Dec	0	100Hz	Line	Gear State
swLaunchControl		uByte	Dec	0	2Hz	Line	Launch switch input state
swRotAls		Float	Dec	0	2Hz	Line	Anti Lag level rotary elaborated value (filtered)
swRotFcy		Float	Dec	0	2Hz	Line	Full course yellow rotary elaborated value (filtered)
swRotMap		Float	Dec	0	2Hz	Line	Map rotary elaborated value (filtered)
swRotPedal		Float	Dec	0	2Hz	Line	Pedal rules rotary elaborated value (filtered)
swRotPitLim		Float	Dec	0	2Hz	Line	Pit Limiter rotary elaborated value (filtered)
tAmbient	°C	sWord	Dec	1	10Hz	Line	Ambient Air temperature (t0) elaborated value (filtered)
tExhaust	°C	sWord	Dec	0	10Hz	Line	Exhaust temperature elaborated value (filtered)
tManifold	°C	sWord	Dec	1	10Hz	Line	Air temperature value (filtered) after intercooler
tManifoldScrut	°C	sWord	Dec	1	10Hz	Line	Air temperature value (filtered) of PT1000 Scrutineering Sensor t2.1 or t2.2
tOil	°C	sWord	Dec	1	10Hz	Line	Oil temperature elaborated value (filtered)
tWater	°C	sWord	Dec	1	10Hz	Line	Water temperature elaborated value
uBarrel	V	sWord	Dec	3	100Hz	Line	Gear Barrel position voltage
vGpsSpeed	km/h	sWord	Dec	1	10Hz	Line	
vWheelFL	km/h	sWord	Dec	1	100Hz	Line	Front Left Wheel speed filtered
vWheelFR	km/h	sWord	Dec	1	100Hz	Line	Front Right Wheel speed filtered
vWheelRL	km/h	sWord	Dec	1	100Hz	Line	Rear Left Wheel speed filtered
vWheelRR	km/h	sWord	Dec	1	100Hz	Line	Rear Right Wheel speed filtered

3.1. VAG SYSMA

Audi will flash a homologated project into the ECU's. SYSMA projects contains several files and functions:

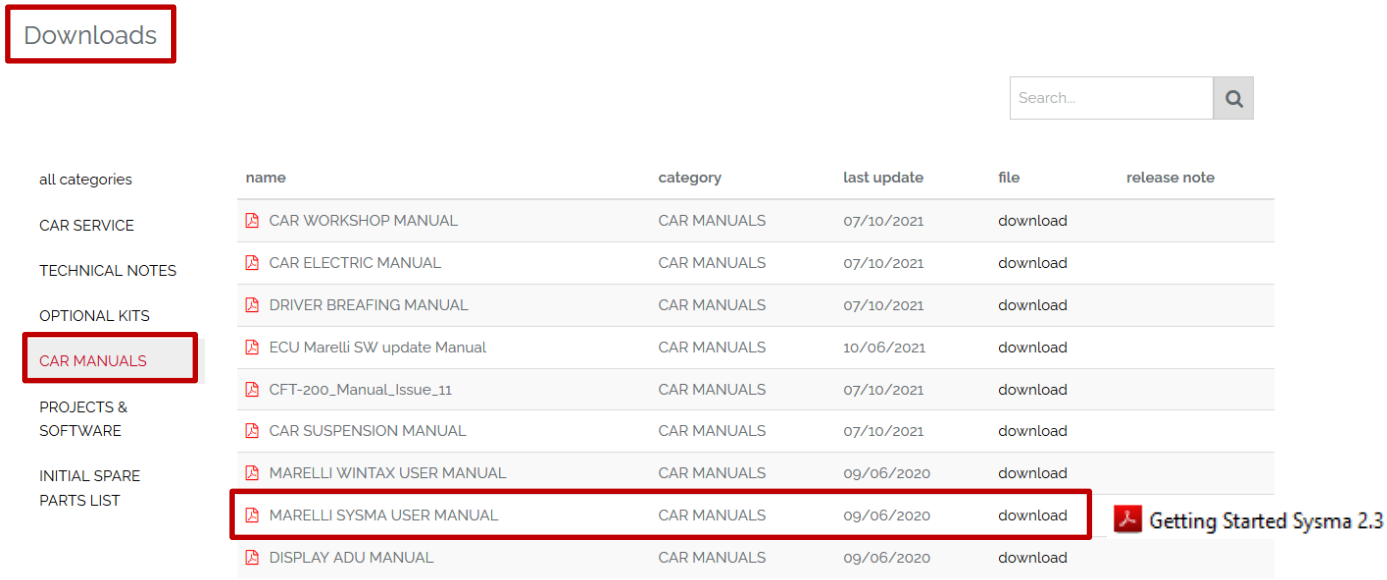
- **CLX files** that contain the engine maps.
  CAUTION. Teams cannot modify CLX files since it could be dangerous for the engine and modifies the homologated checksum.

- **TDX/TPX files** are the acquisition tables. Teams can create their own tables to do the data logging.

- **ATENTITON! IP address for ethernet connection used by your computer must be set manually to IP address 192.168.1.20 - subnet mask 255.255.255.0**

  More information about the SYSMA installation, first settings, project managing, acquisition tables and how to flash them into the ECU is explained in the "Getting Started Sysma 2.3.pdf". It can be found in the AUDI RS 3 LMS repository.

https://vwgroupmotorsport-onlineplatform.com/storage/downloads/Getting%20Started%20Sysma%202.3.pdf



- **GPS Track data**. Data lap triggering is done by GPS in the ECU, so every time teams want to record triggered data they may include track GPS information.

  More information about how to include new tracks step by step.

Downloads

Search...

all categories

CAR SERVICE

OPTIONAL KITS

TECHNICAL NOTES

CAR MANUALS

PARTNER SPARE PART SUPPORT ON CIRCUIT

PROJECTS & SOFTWARE

PLATFORM FUNCTIONALITIES

SPARE PARTS LIST & TECH REPORT

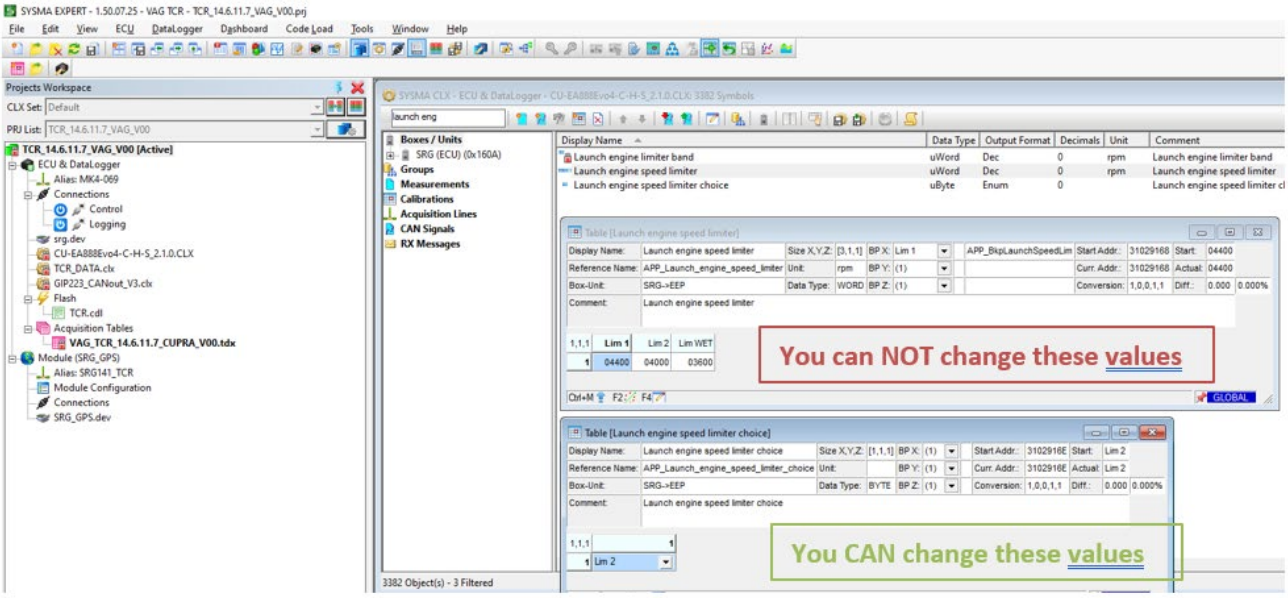
name	category	last update	file	release note
Quick Guide for Electronic Updates & Calibrations	CAR MANUALS	30/07/2024	download	
SADEV ST-90-17 Audi Catalogue	CAR MANUALS	12/07/2024	download	
HEWLAND gearbox CFT-200_Manual_Issue_19	CAR MANUALS	31/05/2024	download	
SADEV ST-90-17 -Gearbox Manual	CAR MANUALS	12/07/2024	download	
DREXLER SLIP DIFFERENTIAL INSTALLATION MANUAL v2 GER	CAR MANUALS	15/12/2022	download	
DREXLER SLIP DIFFERENTIAL INSTALLATION MANUAL v2 EN	CAR MANUALS	15/12/2022	download	
ECU & DISPLAY SW UPDATE PROCESS MANUAL	CAR MANUALS	02/09/2022	download	
MARELLI SRG_141 TCR GPS Beacon	CAR MANUALS	02/09/2022	download	SRG_141_TCR_GPS_Beacon
AU_RS_3 Öhlins Manual	CAR MANUALS	26/07/2023	download	
GPS & Beacon settings	CAR MANUALS	07/03/2022	download	
AUDI RS3 LMS WORKSHOP USER MANUAL	CAR MANUALS	08/11/2023	download	

Audi Sport customer racing

3.1.1. LAUNCH LIMITER SETUP

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.

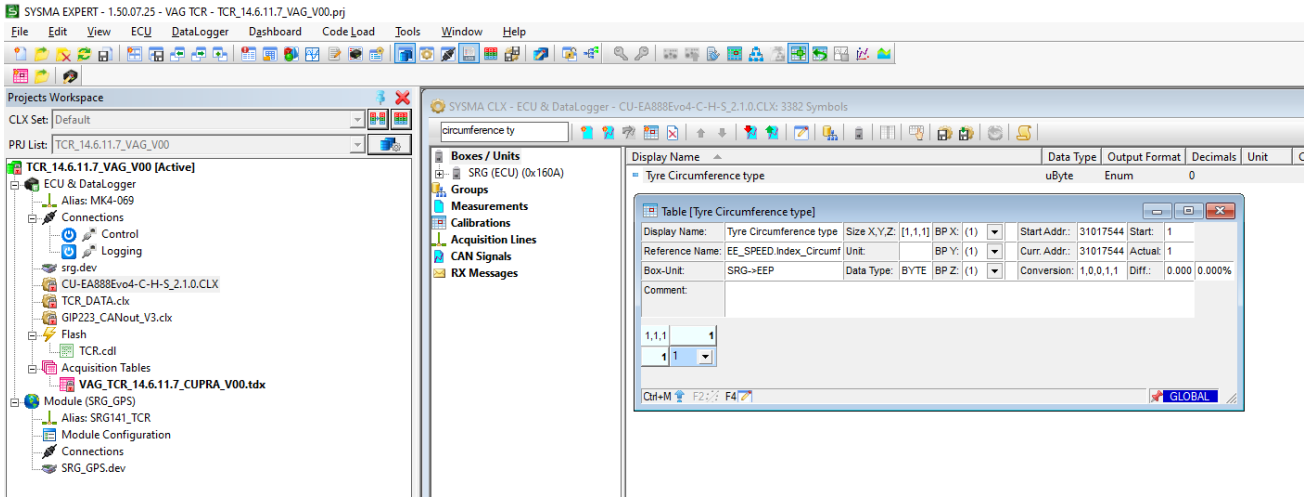
3.1.2. TIRE CIRCUMPHERENCE SETUP

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.

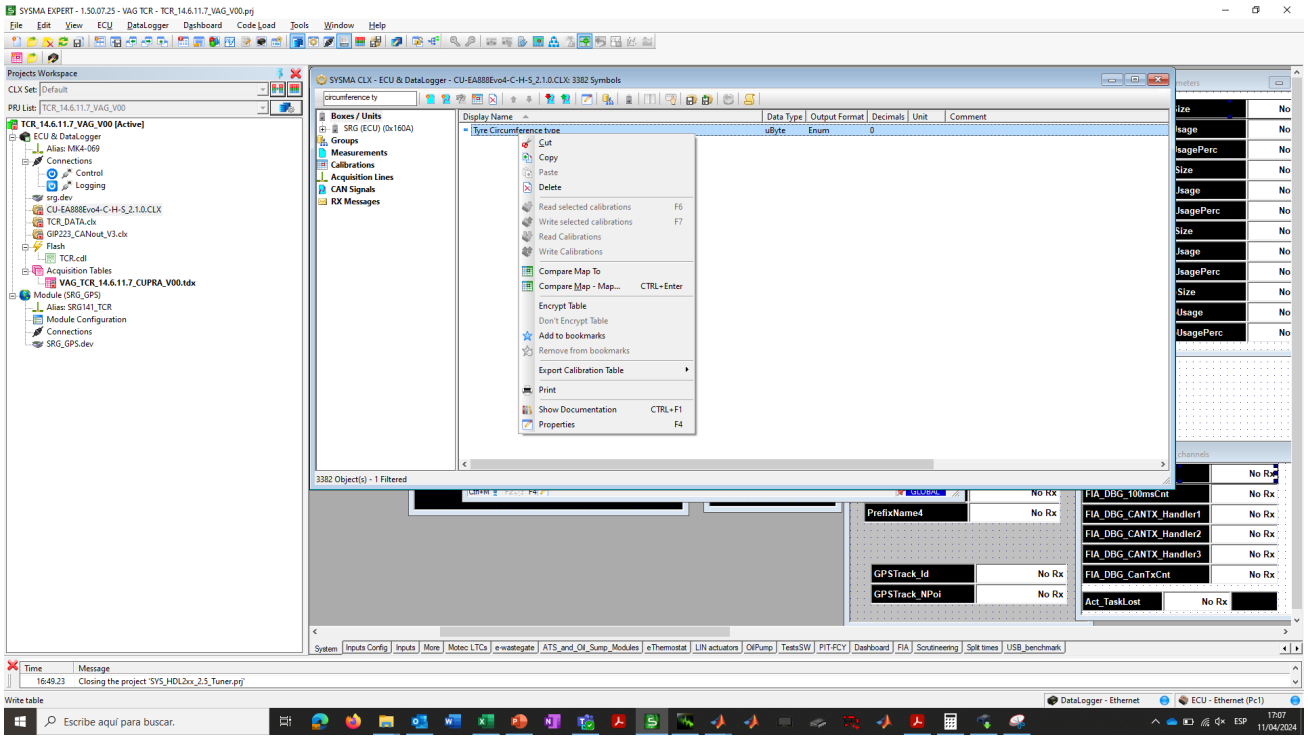
To do it, you must open the .clx file and look for the parameter **Tyre Circumference Type.**

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.



Audi Sport
customer racing

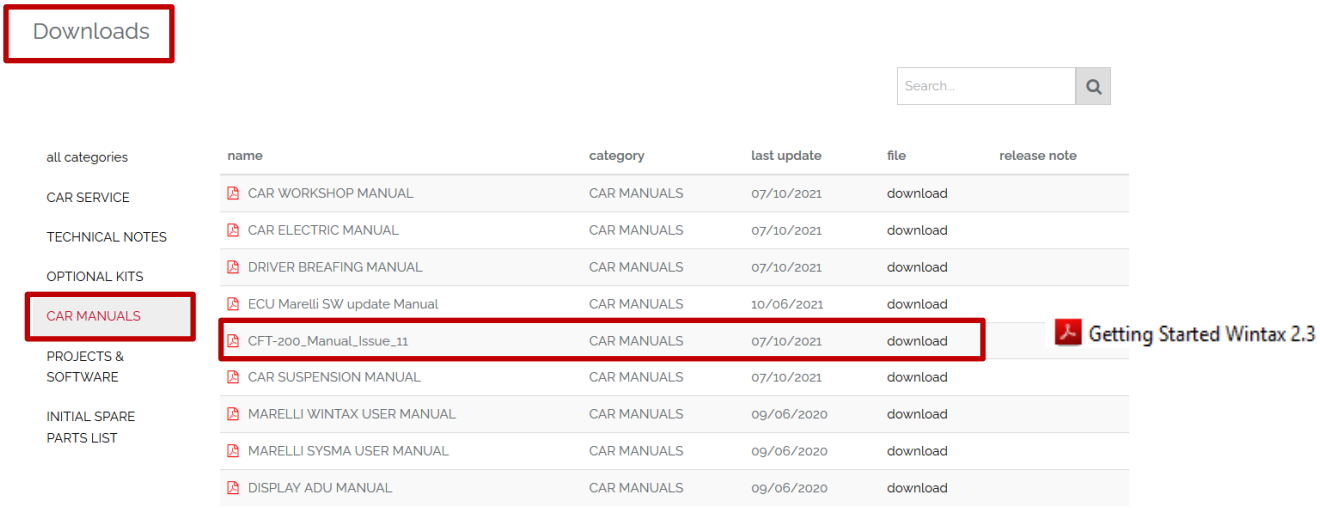
3.2. VAG WINTAX

VAG WinTAX will be used for downloading data that was previously setup in the acquisition tables with VAG SYSMA. Then, data could be post-processed and analysed.

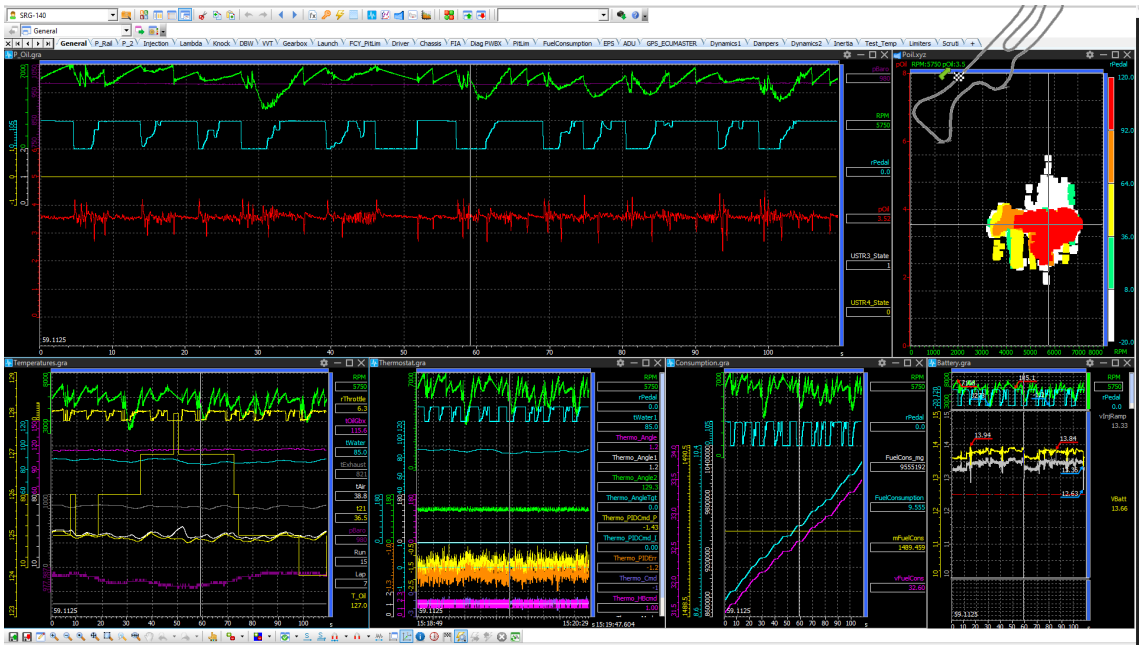
More information about:

- WinTAX installation & first settings
- Data download step by step.
- Open data and create layouts to visualize data.

will be found in the “Getting Started WinTAX 2.3.pdf”.



User layout VAG TCR:

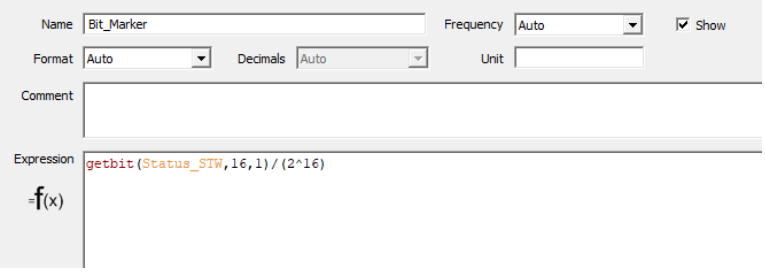


Audi Sport customer racing

To use the marker function of the stw-button “Marker” on the data you´ll need to establish a mathematic channel in WINTAX:

Click -> “tools” -> “virtual channels”

Create this channel:



After you are done click the green hook on the top left to save all the action.

4. LOGGING OPERATING VALUES

Engine:

Channel	Description	Value
pOil	Oil pressure (bar)	3,2 bar at idle speed when hot - 3,8 avg while running - peaks under 2bar for less than 1s under breaking normal
tOil	Oil temperature	Up to 135º - if run over this temp changing the oil is recommended
tWater	Coolant temperature	Normal working range 80 to 95º - Up to 110º in hot conditions can happen - over this value check your radiators add engine
t21 (max)	Intake temperature	Up to 70º normal, if values above try to avoid slipstreams on track and check your IC
rPedal	Throttle pedal position	0 to 105%
Thermo_Angle	Thermostat angle º	180 to 80 engine warm up range - 80 to 1 normal working range on track - 80 full closed flow to radiators - 1 full open
pFuel	Low fuel pressure (bar)	5 to 7 - if lower peaks found on straight-line with more than 5 litres of fuel check you fuel pump and filter
pRail	High fuel pressure (bar)	Nominal value on full throttle 200 - if peaks between 250 and 500 bars spotted on data replace the HP pump

Gearbox:

Channel	Description	Value
tOilGbx	Gearbox oil temperature	Under 120º while running - if run over this temp changing gearbox oil is recommended
p_GbxComp	Gearbox compressor pressure (bar)	7,8 - 10 while running
uBarrel	Barrel potentiometer value (**mV**)	R – 530 / N-1100 / 1- 1650 / 2- 2200 / 3- 2780 4- 3350 / 5-3910 / 6- 4470
pClutch	Clutch pressure	0 - 35 bar
posGear	Selected gear	0, N - 1 to 6, 1st to 6th

Steering:

Channel	Description	Value
bSteering	steering angle	From -327º to 327º

ABS:

Channel	Description	Value
ABS_Active	ABS intervention flag	0, not active - 1 active
ABS_diag_ABSunit	Hydraulic unit related problems	0, no faults - 1 error
ABS_diag_FL	FL wheel speed signal	0, no faults - 1, wiring realted fault - 2, signal related fault
ABS_diag_FR	FR wheel speed signal	0, no faults - 1, wiring realted fault - 2, signal related fault
ABS_diag_RL	RL wheel speed signal	0, no faults - 1, wiring realted fault - 2, signal related fault
ABS_diag_RR	RR wheel speed signal	0, no faults - 1, wiring realted fault - 2, signal related fault
ABS_diag_FusePump	Hydraulic pump fuse diagnosis	0, no faults - 1 error (fuse or pump power supply)
ABS_diag_FuseValve	Hydraulic valve fuse diagnosis	0, no faults - 1 error (fuse or valve power supply)
ABS_diag_P_FA	Front brake pressure signal	0, no faults - 1 error
ABS_diag_P_RA	Rear brake pressure signal	0, no faults - 1 error
ABS_diag_YRS	Yaw sensor diagnosis	0, no faults - 1 error
ABS_Lamp	ABS system On/Off	0, ABS On - 1, ABS Off or faulty
ABS_Malfunction	If any ABS diagnosis is active	0, no faults - 1 error
ABS_Switch_Position	ABS map	1 to 11 working positions - 12 ABS Off

Electrics:

Channel	Description	Value
vBat	Battery voltage	Over 12,6V with engine running - Avg around 13,5V
I_FuelPump	Low pressure fuel pump current consumption	20A constant running
I_GBX_Compressor	Gearbox compressor current consumption	Up to 100A when starting - 19,5A constant running
I_FrontFan	Radiator fan current consumption	25A peak when starting - 6,4A constant running
SW extinguisher	Fire extinguisher switch	0, not used - 1, using

GPS:

Channel	Description	Value
bGpsLatitude	Latitude coordinate	Dependant on location
bGpsLongitude	Longitude coordinate	Dependant on location
Status_GPS	Status	4, normal use - any other number check your GPS

Scrutineering:

Channel	Description	Value
pAmbient	Ambient pressure (mbar)	equal to ambient pressure
crcPartialzero	Checksum 1	Check last BoP bulletin
crcPartialone	Checksum 2	Check last BoP bulletin
crcAPP	Sysma project checksum	Check last BoP bulletin
PWR_Level	Power level switch position	1, 90% - 2, 92,5% - 3, 95% - 4, 97,5% - 5, 100% - 6, 102,5%
Noverboost	Number of overboost since last power cycle	Should be 0, if not check your turbo parameters

5. ELECTRICAL CALIBRATIONS

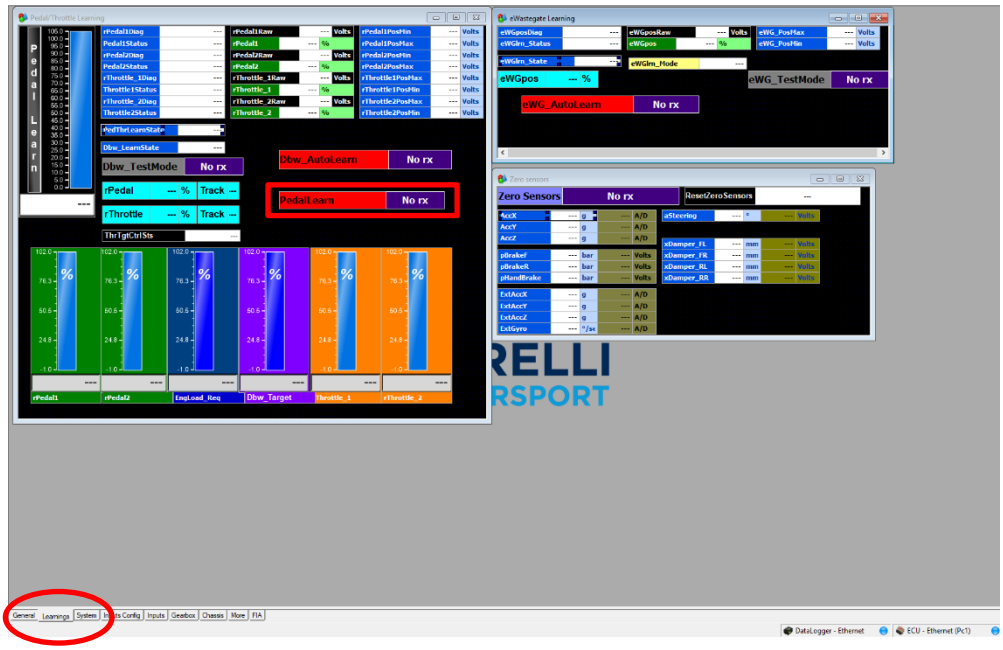
Every sensor of Audi is calibrated and tested during the manufacturing process. However, if some components are replaced, a calibration is required. It consists on a quick process using SYSMA.

These common steps must be follow 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.

5.1. PEDAL LEARNING

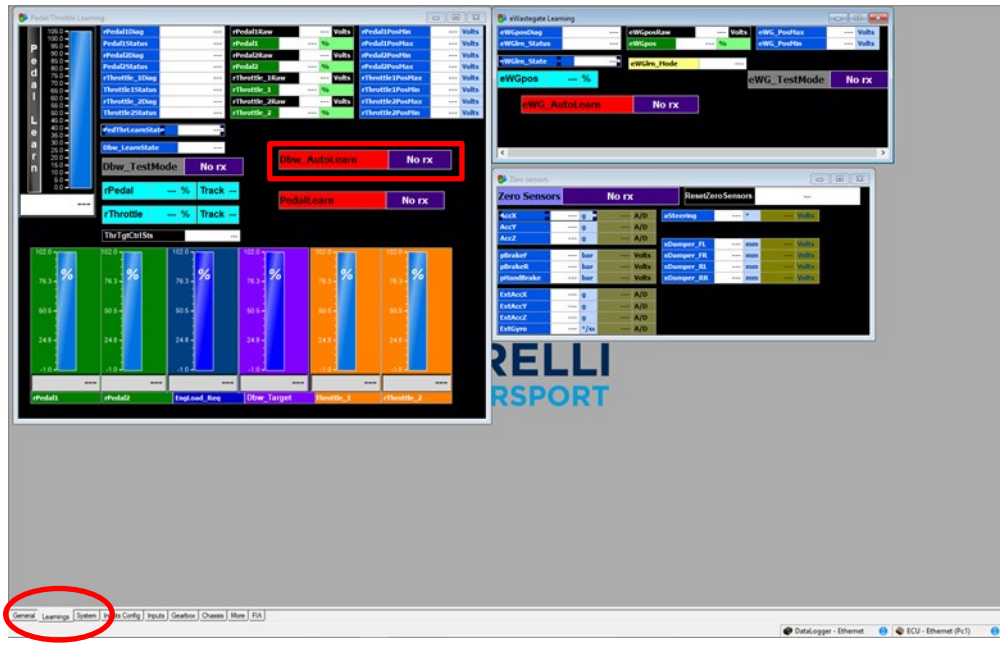
- Go to the “Learnings” tab.



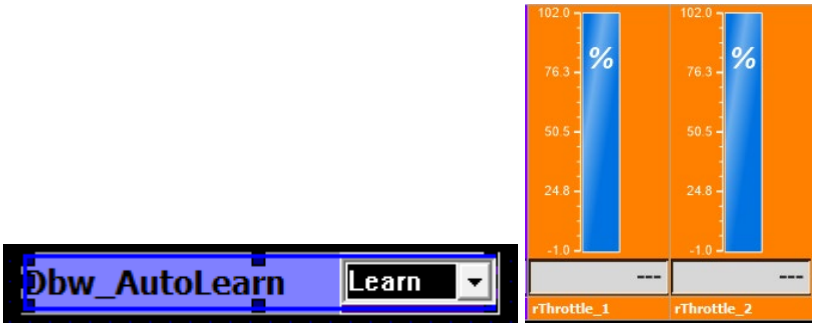
- While the pedal is released / not physically pressed, select “min” in SYSMA. Then press the pedal 100% and select “max”.

5.2. THROTTLE AUTOLEARN

- Go to the “Learnings” tab.

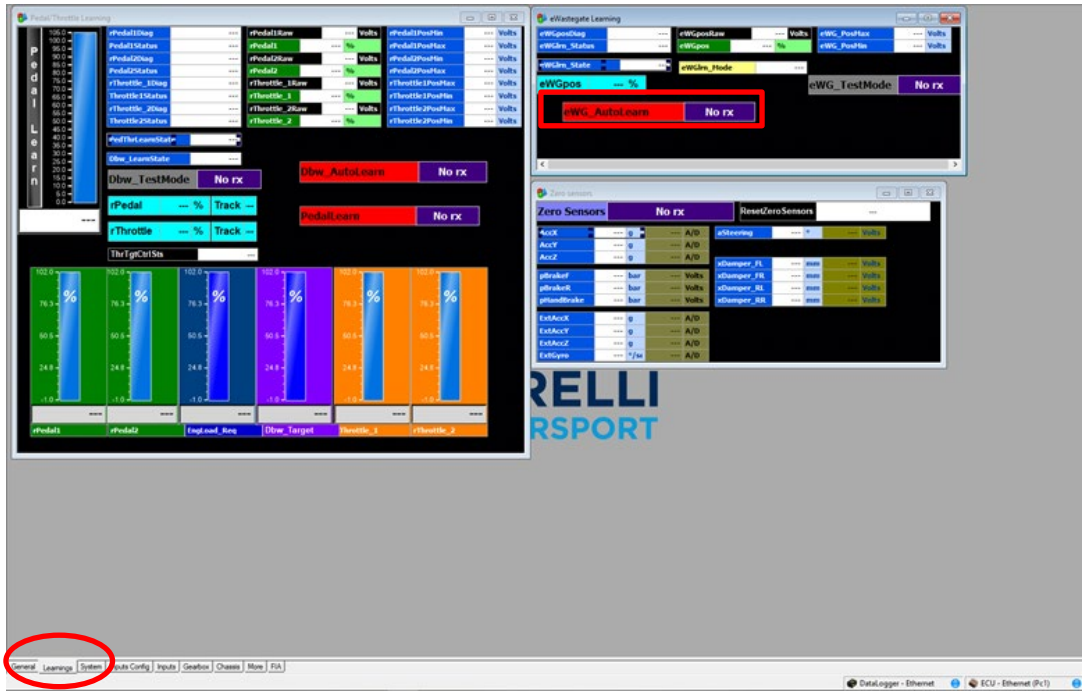


- Select the learn option and press out of the violet rectangle to initiate the auto learn process. You will observe the throttle bars going from 0- 100% automatically.

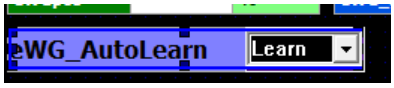


5.3. E-WASTEGATE AUTOLEARN

- 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.

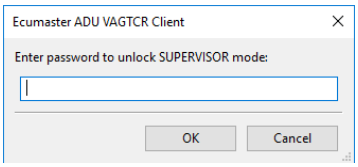


After all the calibrations are done, the car must be completely power cycled (KL30).

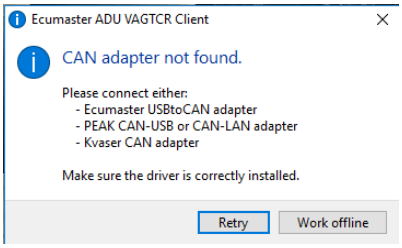
6. DRIVER DISPLAY

Section 2 of this manual shows how to connect your computer the display, the recommended wiring and connector. To sum up, you need:

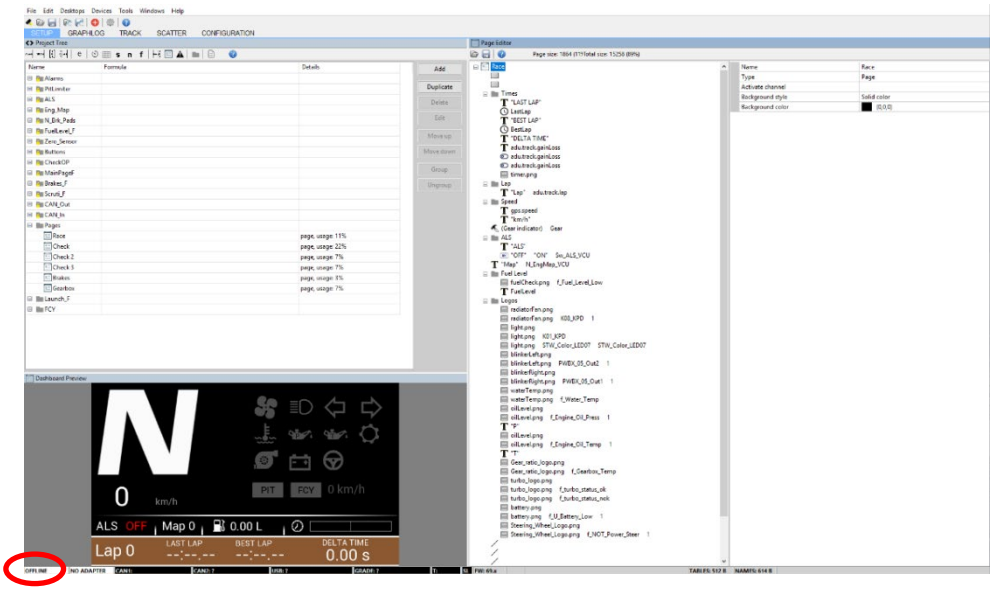
- Connect your computer to CAN_2 of the DIAG connector by using a CAN interface.
- Install in your computer the software “ECUMASTER ADU VAGTCR Client” provided by Audi.
- Once the setup is done, open the app. It will ask a password; just skip this step by clicking cancel. The supervisor mode is just for administrator access.



- If the wiring loom is not connected or there is a problem in the connection, it will appear the following pop-up:



- If you want to work offline, click on it. Otherwise, check the connection.
- Once the app is opened, if everything is correct, the status should be CONNECTED with a green background.

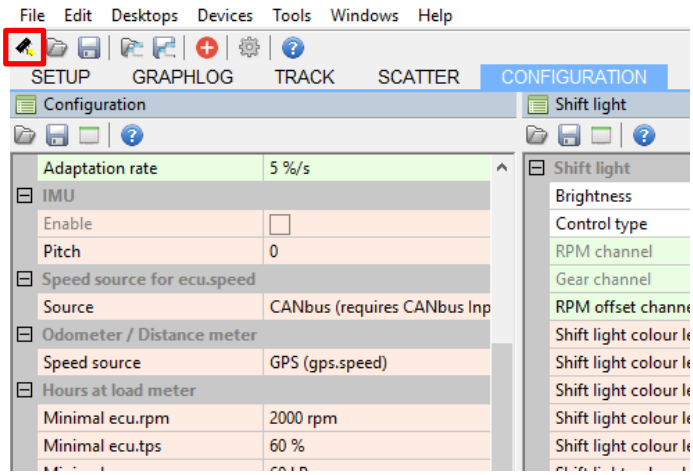


Audi Sport customer racing

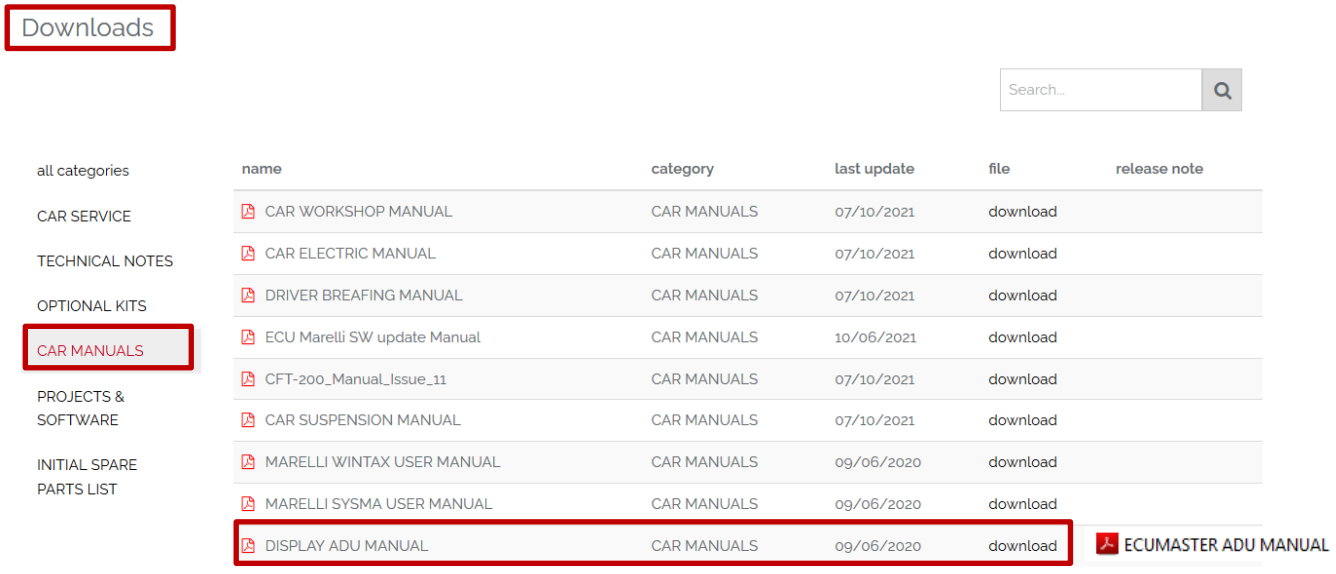
There are two main tabs where the teams will work:

- SETUP.
  - Create and modify the display's layouts
  - Read new CAN signals to show in the display
- CONFIGURATION
  - Setup shift lights
  - Setup alarms
  - Modify display's brightness
  - Include new tracks for GPS lap triggering

Once the modifications are done, click on "Make permanent" to flash the display:



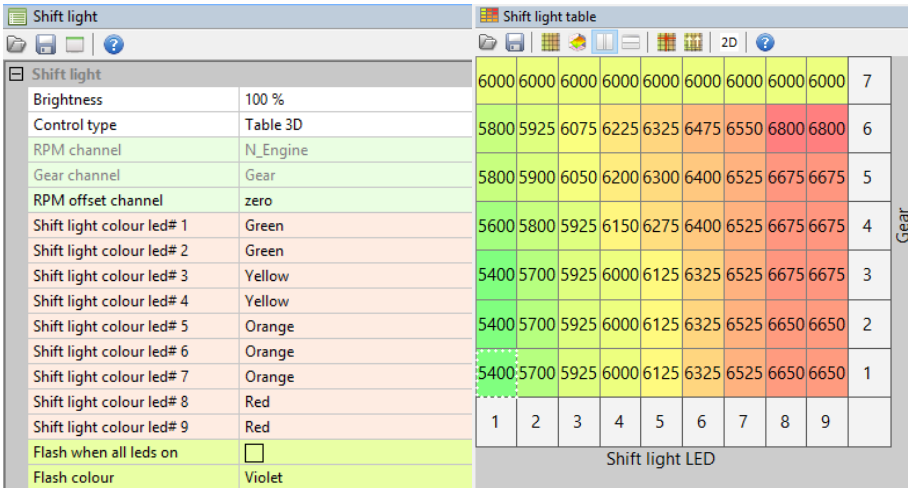
The following chapter explains the main customizations available. More information about the ECUMASTER app installation and customization process in the "ECUMASTER ADU MANUAL.pdf". It can be found in the AUDI RS 3 LMS repository.



6.1. CUSTOMIZATION

6.1.1. SHIFTLIGHTS

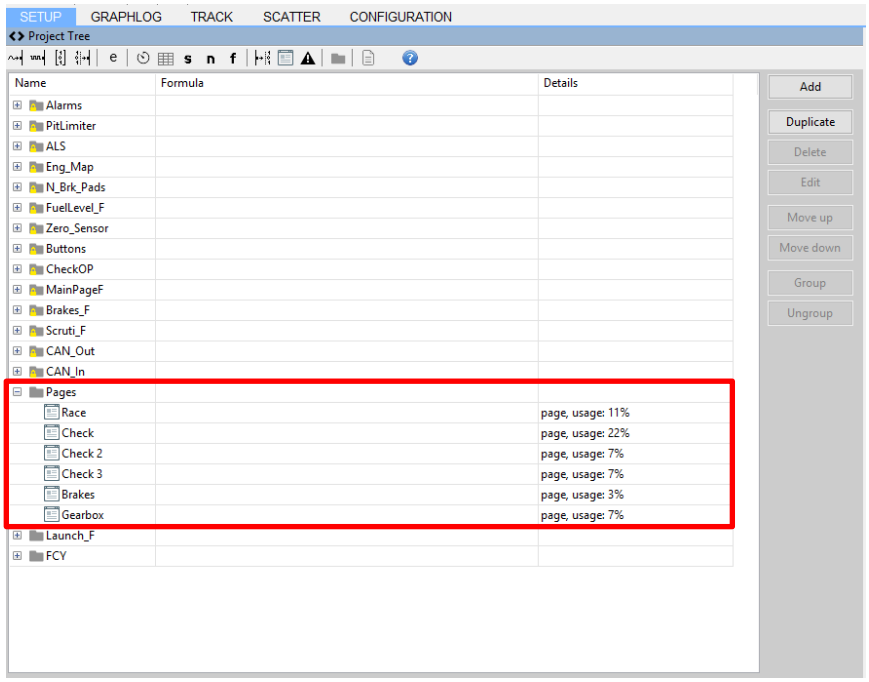
RPMs, shift lights colour, brightness and flash mode can be changed in the following panes.



The “flash when all leds on” is very handy to show the driver the correct shift-point by flashing all LEDs. To activate set the hook in the box and click “make ermanent”.

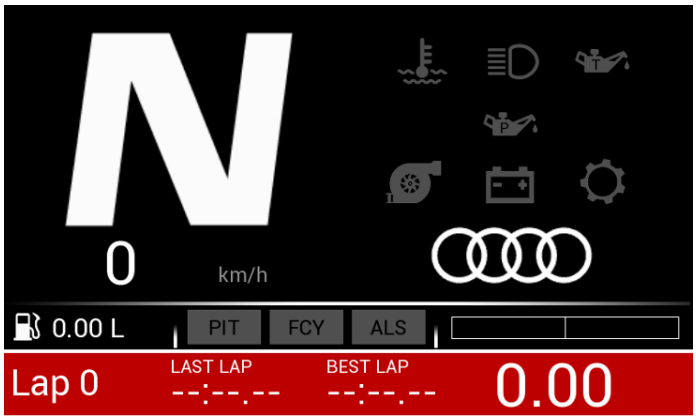
6.1.2. PAGE LAYOUTS

Every display comes with the necessary pages and overlay pages to race:

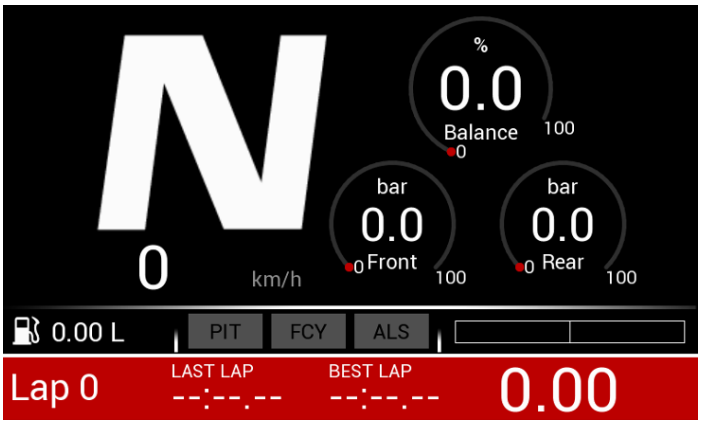


Audi Sport
customer racing

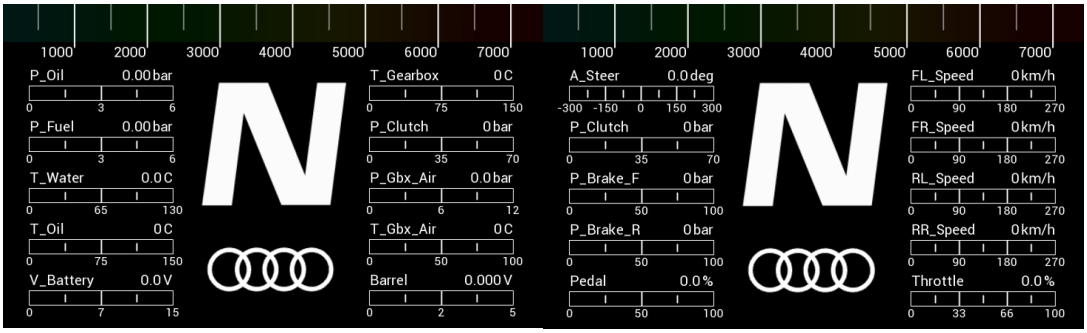
\ **Race.** Main display, used during racing.



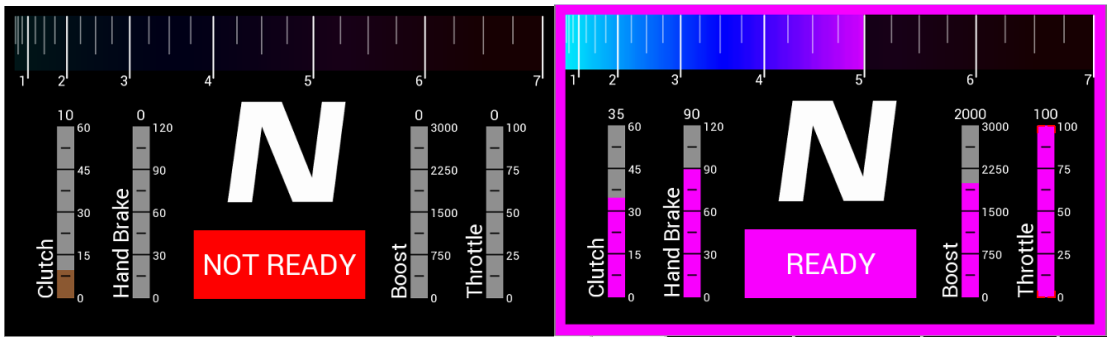
\ **Brakes**. Extra info focusing on brakes.



\ **Warm up 1 & 2**. Extra info focusing on the engine, gearbox and sensors.

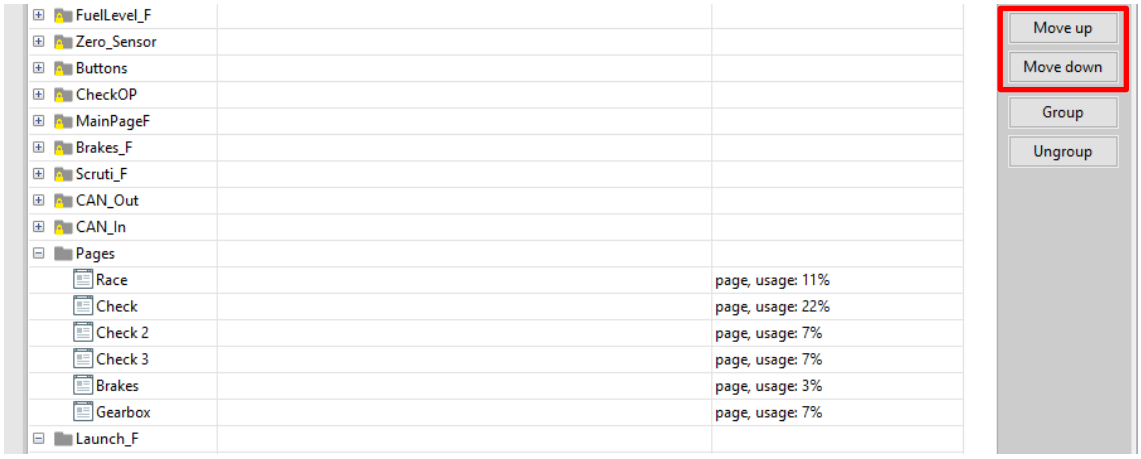


\ **Launch**. Displayed when the driver is pressing the Launch button of the steering wheel module.



\ **Non-modifiable overlay layouts.** FCY, PITLIM & ALS

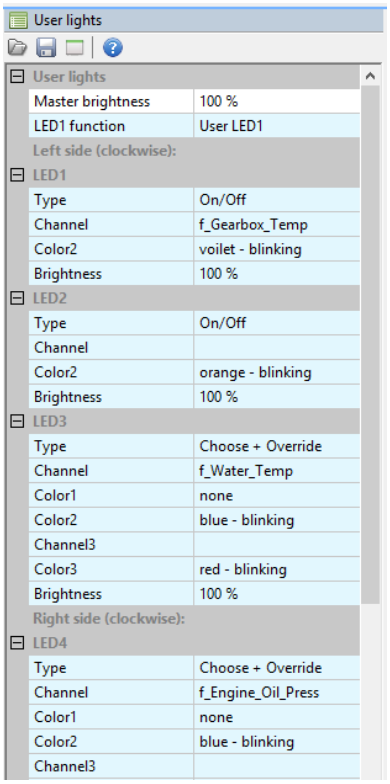
Note that it is possible to modify the order of the displays by moving up/down:



Finally, you can create your own pages, by clicking on add >> page.

6.1.3. ALARMS

Driver's Briefing Manual explains in detail preconfigured led alarms conditions. If teams can modify them through this menu:



LED	COLOUR	FUNCTION
LED 1	Violet	WARNING. High gearbox oil temperature. T > 125ºC

		Drive out of the slipstream and keep checking the temperature value
	Violet - Blinking	MAJOR WARNING. Very high gearbox oil temperature. T > 145ºC Drive out of the slipstream and keep checking the temperature value. If it is not decreasing, the recommendation is to retire the car.
LED 2	Blue	High intake temperature. T > 69ºC Drive out of the slipstream and keep checking the temperature value since it may cause a torque reduction
LED 3	Orange	WARNING. High engine water temperature. T > 110ºC Drive out of the slipstream and keep checking the temperature value. If no red alarm appears, you can continue. If the alarm disappears, keep pushing
	Red - Blinking	MAJOR WARNING. Very high engine water temperature. T > 125ºC Drive out of the slipstream and keep checking the temperature value. If it is not decreasing, the recommendation is to retire the car.
LED 4	Orange	WARNING. High engine oil temperature. T > 150ºC Drive out of the slipstream and keep checking the temperature value.
	Red - Blinking	MAJOR WARNING. Low engine oil pressure. P < 1.2 bars Major risk of breaking engine components. It is highly recommended to slow down the car. If the alarm stays, stop the car in a safe location.
LED 5	White	Low fuel pressure. P < 3 bars

		Check the fuel level
LED 6	Cyan	Battery low voltage. V < 11.5V Check the alternator and the poly-V belt
	Violet	Low pressure at the gearbox pneumatic accumulator. P < 6.5 bars Check the compressor and the pneumatic circuit

6.1.4. TRACK GPS LAP TRIGGERING

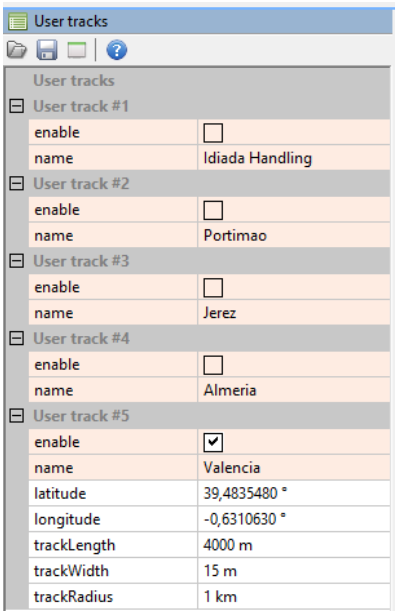
Lap triggering of the timings showed in the display is done by GPS. Tracks' information included in the display are the followings:

SPAIN	Motorland	**GERMANY**	Lausitzring	**RUSSIA**	KazanRing
	Jerez		Sachsenring		Sochi
	Montmelo		Hockenheim		Moscow
	Jarama		Oschersleben		Smolensk Ring
	Navarra		Nürburgring GP		Fort Grozny
	Calafat		Nürburgring Nordschleife	**MALAYSIA**	Sepang
	Castelloli	**UK**	Donington	**SINGAPORE**	Marina Bay
	Albacete		Silverstone	**SOUTH KOREA**	Inje International
	Almeria		Brands Hatch		Korea International
	Valencia		Knockhill	**THAILAND**	Bang Saen
PORTUGAL	Estoril		Oulton Park		Bira
	Portimao	**CZECH REPUBLIC**	Most		Buriram
	Vila Real		Brno	**MACAO**	Macau Grand Prix
BELGIUM	Spa	**QATAR**	Losail	**CHINA**	Ningbo
	Zolder	**BAHREIN**	Bahrein		Shangai
NETHERLANDS	Assen	**UAE**	Yas Marina		Zhejiang
	Zandvoort		Dubai Autodrome		Zhuhai
HUNGARY	Hungaroring	**SOUTH AFRICA**	Kyalami	**JAPAN**	Autopolis
SLOVAKIA	Slovakiaring	**MOROCCO**	Marrakech		Fuji
AUSTRIA	Red Bull Ring	**ARGENTINA**	Termas de Rio Hondo		Okayama
	Salzburgring	**BRAZIL**	Interlagos		Twin Ring Motegi
FRANCE	Le Mans	**CANADA**	Montreal		Suzuka
	Magny Cours	**MEXICO**	Puebla		
	Paul Ricard		Hermanos Rodríguez		

ITALY	Vallelunga	**USA**	Daytona
	Adria		Austin COTA
	Mugello		Laguna Seca
	Misano		Sebring
	Monza		Sonoma
	Imola		Indianapolis
SWEDEN	Anderstorp	**NEW ZEALAND**	Hampton Downs
	Falkenberg		Highlands
	Knutstorp		Pukehoke
	Karlskoga	**AUSTRALIA**	The Bend
	Skelleftea		Phillip Island
	Mantorp park		Bathurst Mount Panorama
DENMARK	Copenhagen		Melbourne Albert Park

6.1.5. EDIT SPECIFIC TRACK

Teams may include they own tracks if needed in the following menu. Up to five additional track can be included.



If there is a conflict between track's data from the display's memory and the one introduced manually, the manually one's remains as a priority.

6.1.6. ADDING A NEW POI

Open the desired project and select the label CONFIGURATION

On the window User tracks, mark one of them and modify the settings with the new POI.

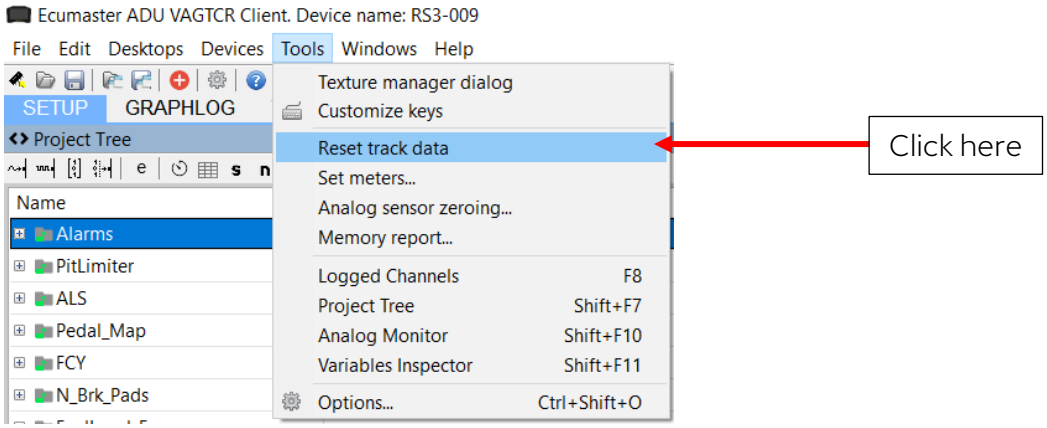
If the laptop was not connected with the display, reconnect with it on label Devices/Reconnect, and select the User data.

Click on label File/Make Permanent to save the project on the display.

6.1.7. RESET TRACK DATA

In case there is no indication of delta-laptimes and split-times you´ll need to reset track-data. There is the former reference lap still in the storage and this will disallow to calculate the lap-times correctly.

Click on “tools” and “Reset track data”:



In case of tracks with different lap length (e.g. 24h Nürburgring with option of shortcut through GP track you make sure that you have a proper delta / predictive laptime with this procedure:

- Power cycle during every pitstop (ignition off & mainswitch off – wait 10 sec -switch on again)
- After running the shortcut press the marker button after crossing start-finish-line Press the button as long until the time of “last lap” disappears
- During the first lap you will have no reference time, but after all will work fine

6.1.8. GPS ANTENA

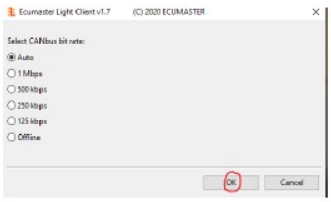
GPS antenna from the car have the software updated.

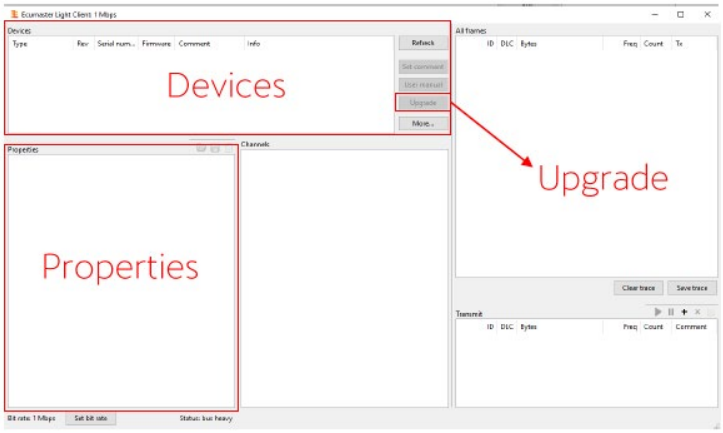
GPS module spare part bought directly from ECUMASTER dealers could not be updated with the right Software. In this case, use the Software **LightClientSetup_1_7.exe** and **gps_15_0.bin** file to update the GPS module.
SW and file are available on the VW Group Motorsport online platform download area "Projects&Sotware"

Procedure to update GPS module SW.

1. Install LightClientSeraup_1_7.exe in your computer
2. Connect the display CAN interface to the diagnostic connector and switch Power supply
3. Open the LightClient application and choose "auto" as CAN bit rate
4. In the device zone, choose the GPS module. Double click on it.
5. Click on the Upgrade and select the file "gps_15_0.bin"
6. Wait until then firmware update is done.
7. In the properties zones, satellites, **select just GPS**. Not GPS + GLONASS
8. Disconnect the computer and power cycle the car.

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



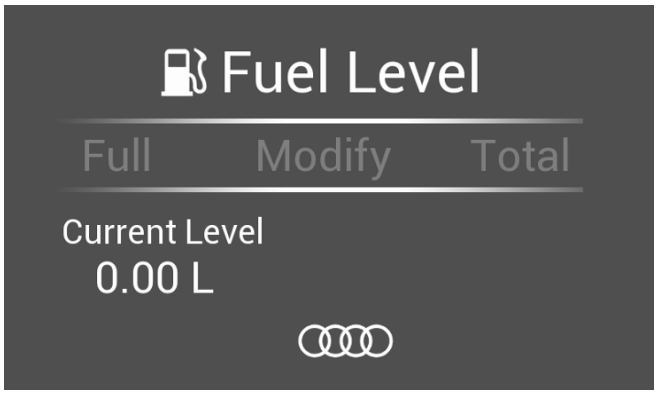


6.2. FUEL LEVEL DISPLAY

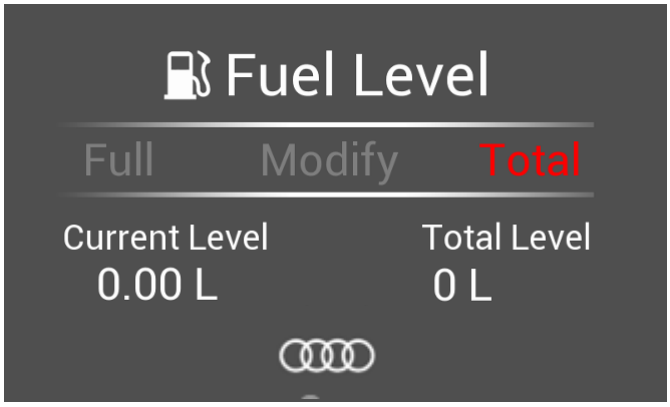
To set up the fuel level in the display after a display, there are three modes:

- **Full**. Set up the car to 100L
- **Modify**. Add or subtract fuel to the current level of the fuel level
- **Total**. Establish the total fuel available in the tank without considering the current value showed by the display

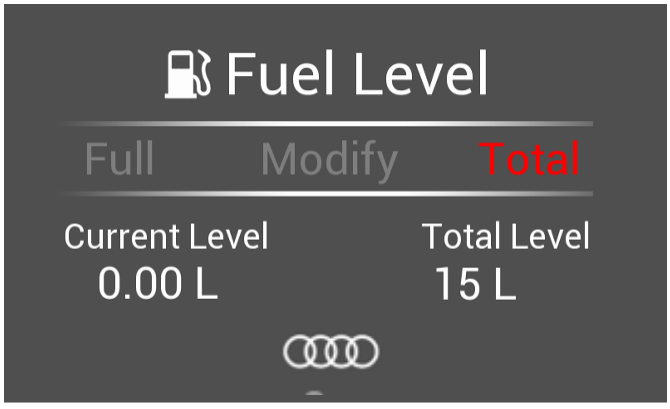
A) To start the setup, with the engine stopped press Fuel button (bottom left).



B) Select the fuel mode by pressing MODE as many time as needed.



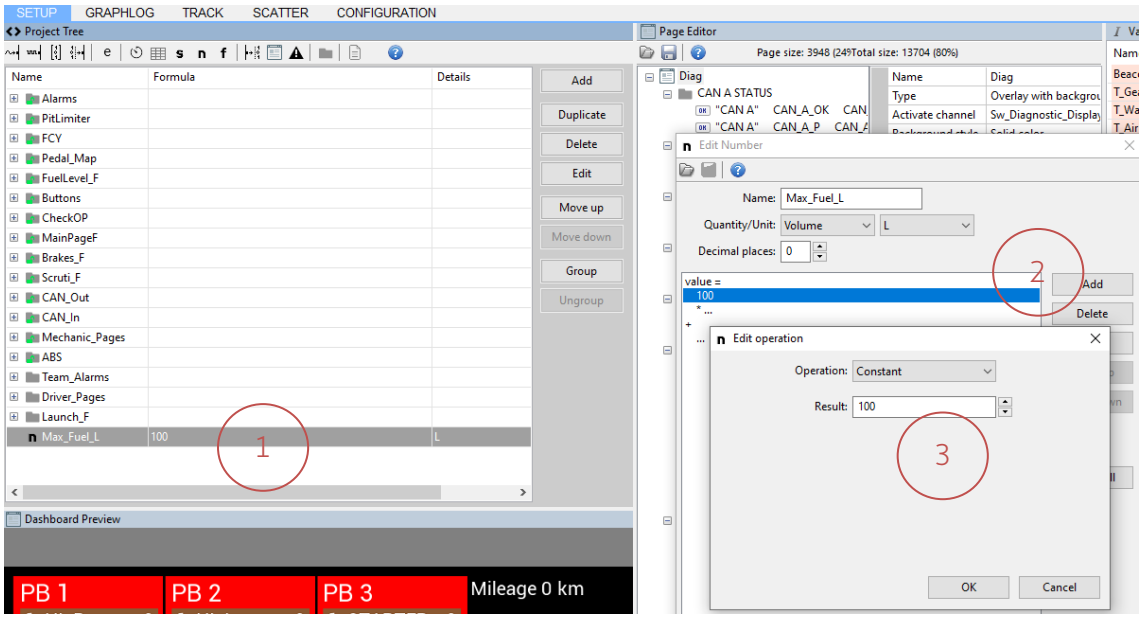
C) Finally choose the amount by pressing up/down buttons.



Setup value of “Full” function:

The pre-stablished EcuMaster display configuration is fixed to 100L. There are championships where regulations reduce or limit the fuel tank capacity (volume of fuel cell), by adding balls, (e.g. IMSA 72 lts.). If fuel cell capacity have to be reduced, it is possible to modify the value with the function **“full”** and pre-establish a different value.

How to modify this value: Use EcuMaster ADU SW / Project tree and doble click into the to Max_Fuel_L. Change the value to your preference.



Audi Sport customer racing

6.3. POWERBOX MONITORING DIAGNOSIS

Note:

To use the functions explained below, following steps have to be performed:

1. Update the Gateway configuration

2. Update the ECU channel table (logging table)

3. Update the ADU configuration

The files to perform the update are available with the latest software package from July '24

SW_INSTLLATION_2024-v02	PROJECTS & SOFTWARE	30/07/2024	download

A monitoring tool checks permanently the status of the power boxes of the vehicle. If there is the suspect of a malfunction of any device or function, it's recommended to check the status of the powerbox, it can come by the following causes:

- Powerbox is not connected.
- Powerbox harness issue that causes Powerbox to stay off or malfunctioning CANbus
- Powerbox internal malfunctioning
- CAN communication issue / unstable

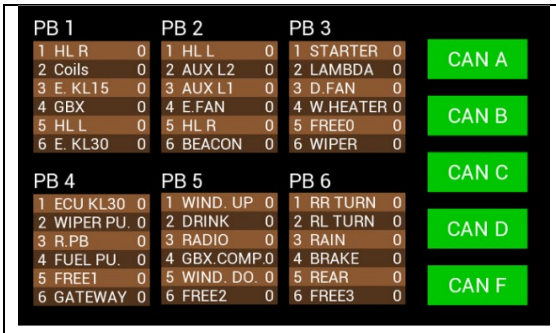
There are 2 ways to check the status of the system, through the **car display** and/or **Wintax data acquisition** system.

1. **Display diagnosis page:** Access by pressing mode button in the keypad for a while. No engine running.

   *This process offers a direct control in the car display and can be used by the mechanics after any reparation or loom disconnection as a check list point.

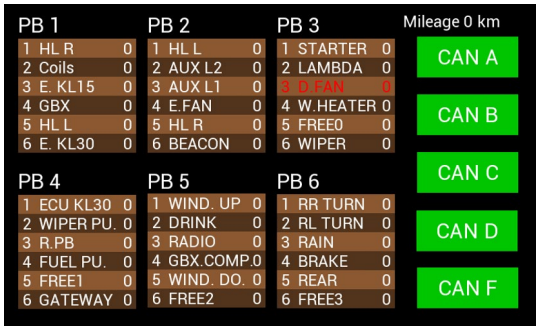
View of PBX's and CAN BUS diagnosis. Background or letters in red color identify the faults:

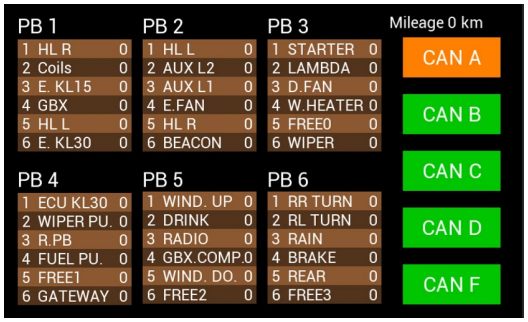
System no errors view:	**System PBX failure view:**
The following image shows a sample display of no errors.	No feedback is received from the PBX. Check ground or kl15 inputs. Replace the pbx



System Powerbox output failure view:
e.g., Driver Fan output 3 failure.
Check device and/or harness.

CAN BUS failure view:
Check harness damages or wire cross
Check any additional acquisition added

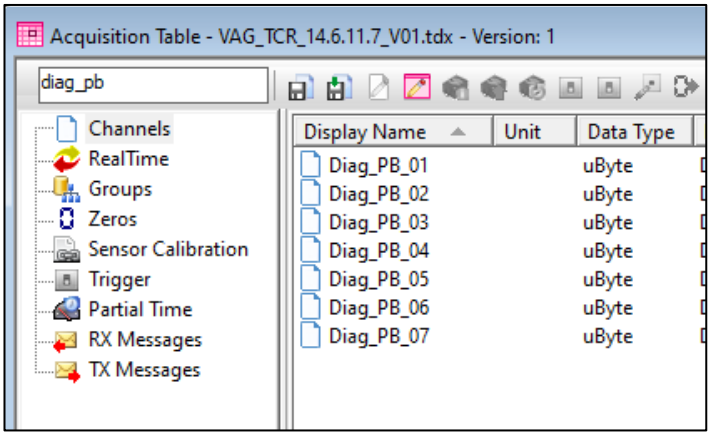




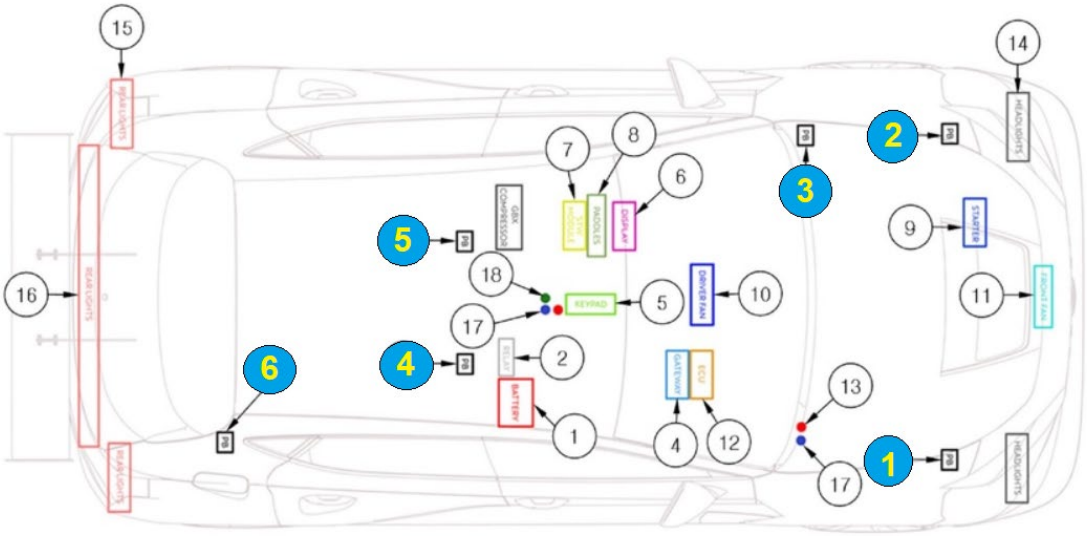
2. **WINTAX data diagnosis**. This procedure is more efficient for the intermittent faults as the system registers the faults at the time it happens.

   Acquisition table version VAG_TCR_14.6.11.7_V02 includes new channels to log the Powerboxes status.

   Diagnosis: Powerboxes with normal working will record value “0” on the Diag_PB logged channels. If any failure appears, the value will change to value “1”.



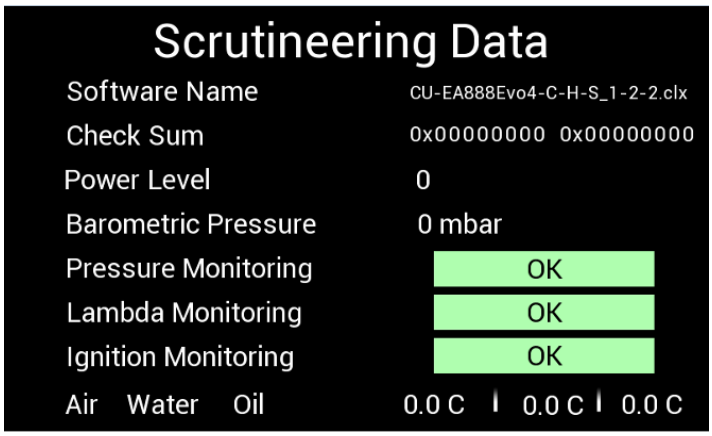
The Blue balls show Powe Boxes allocation in the car with their data acquisition table Diag-PB number:



Audi Sport
customer racing

6.4. SCRUTINEERING DISPLAY

During an official event the team may be asked to show the scrutineering layout in the dashboard. This can be done easily by pressing for 2 seconds the **“MODE”** button of the keypad (bottom right).



6.5. NEW BRAKE PADS DISPLAY

Note: Not available in all cars – depends on configuration of EcuMaster Display

After change of brake-pads you can display the warning for the driver on the DDU display.

To activate this display you have to:

Push “Marker” and right turn-light button (on the back of the steering-wheel) at the same time when shutting down the car (off button).

To deactivate this display you have to:

Push “Flash” button > 3 sec to remove the pop up warning.

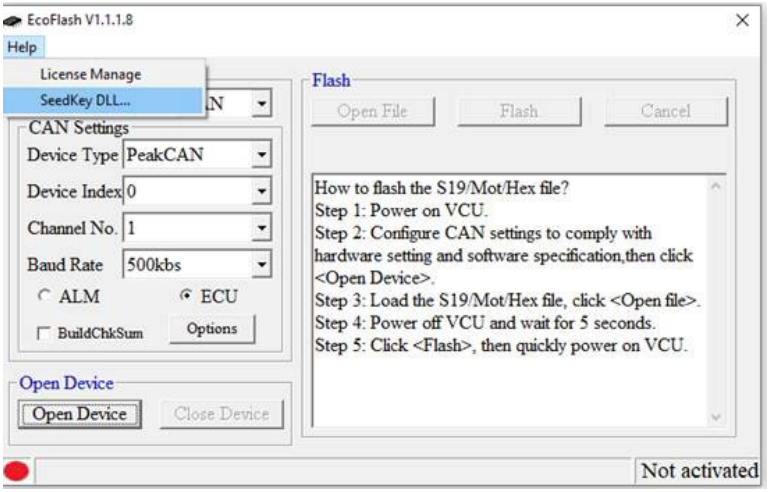
7. GATEWAY

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 installation on the Gateway.

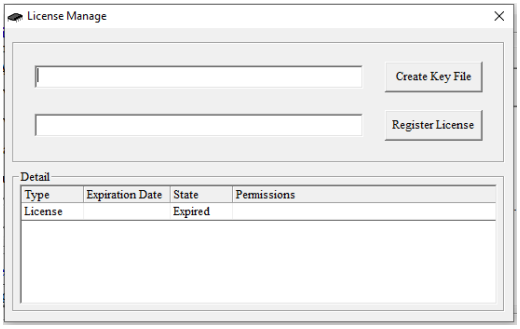
1. Download Ecotron_Gateway.zip folder from the Projects & Software folder at the Download Area on the Online Platform.
2. Uncompress the zip folder. You will find three files inside (EcoFlash_setup.exe, PG_Default.dll and the .mot file that will be flashed)
3. Install EcoFlash software on your PC using 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.

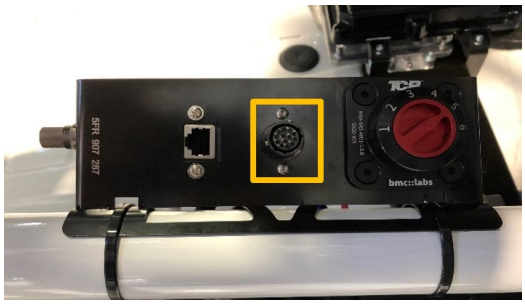
3. You can generate the Key File by going to Help > License Manager > Create Key File. IMPORTANT: provide the Key File of the specific computer you will use for EcoFlash. The licence will only work on that computer.
4. With this information, Ecotron will send you a proforma invoice to be paid and when 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.



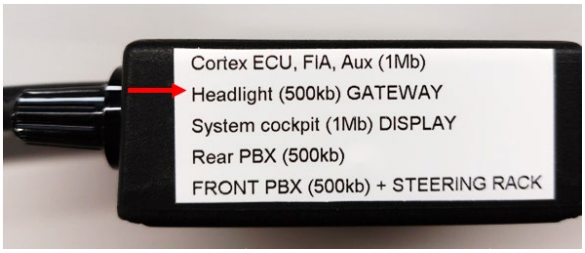
How you can use EcoFlash software to update your gateway:

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:

The gateway will detect on its own if mounted on an **Audi RS3 LMS TCR** or a **CUPRA Leon Competición**.
It will automatically recognise the car and will adapt by itself.

Only for detection CUPRA Leon Competion or CUPRA Leon VZ TCR you have to act:

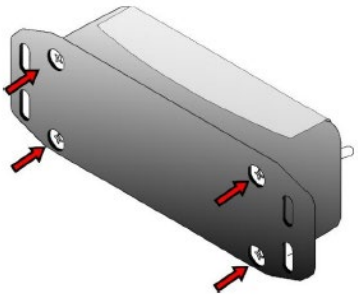
If the gateway will work on a **CUPRA Leon VZ TCR**, after finishing the flashing process, you have to press together and hold the rain lights and windscreen heater buttons and then click on Main OFF switch (marked in Red colour). Then, the electronics car setup will change.

8. FIRE EXTINGUISHER

The **Lifeline Zero 275** extinguisher range (UK Patent Application No. GB1813948.5) is homologated to FIA8865-2015 standard.

IMPORTANT:

1. **Only use alkaline PP3 batteries to spec 6LR61**
2. Before every race, check 9v battery of the fire extinguisher electric box is in the maximum capacity.
3. Remove the 4 screws at the rear of the Control Box to change the battery



Electrical Test

The Control Box has two modes, Test and Armed. When the vehicle is not on circuit or on stage, set the Control Box to Test mode to prevent accidental activation. It is strongly recommended to test the system as described below before every session. This test will also be performed during scrutineering checks.

To test the integrity of the electrical system:

a. Set the Control Box to Test mode by using the switch.
b. Press one of the activation switches. The Control Box will then preform its test cycle.
c. If the system is correctly wired and the battery condition is good, the Amber LED will illuminate for 5 seconds and then go out.

d. If the Amber LED flashes, there is an error in the system:
    1. 2 flashes = Low/Faulty Battery. The Battery must be replaced.
    2. 3 flashes = Circuit Fault. Check that the wiring circuit is correct and that there are no breaks in the circuit.

If the system is showing no faults, it can be set to Armed mode using the switch on the Control Box. The Red LED will now flash every 3 seconds. If the LED does not flash, there is a fault in the system and the system will not fire!

9. ABS (optional kit)

Type: ABS Bosch M5 (motorsport)

Kit content and fitting instructions are available at the VAG mts. online platform download area “Optional Kits”

The system is electronically plug and play. When the car detects the ABS unit the display screen and steering wheel function become active.

Short Push to de the ABS button in the steering wheel to activate / deactivate the system. To change between the 11 maps available (12=OFF), click up/down (left ones) & ABS button simultaneously.

(Same procedure used to change the PIT Limiter or FCY speeds)

10. RACELOGIC VIDEO CAMERA (optional kit)

We offer to the customers a complete plug & play bundle with the two-camera system ready to receive the main driver's data - throttle, brake, rpm and more.

VBOX software tools to customize the video layout and analyses driver performance

Fitting instructions are available at the VAG mts. online platform download area "Optional Kits"

All software installation files can be found on the supplied SD card.

Audi Sport customer racing

11. CHANGE INDEX

Version	Date	Change / amendment	Page
V1	03.09.2021	First edition of the document	
V2	21.10.2021	Correction of several typos and formats	
V3	08.12.2021		
V4	10.01.2022	Setup of display page diagnostic mode added Setup of display page “new brake-pads” added Change index added	14 37 38
V5	01.06.2022	IP address corrected Graphic of alarm-LEDs added; Alarm definitions corrected	18 33-34
V6	30.01.2023	Logging and operation values GPS Antenna Acitvate / deactivate “New brake pads” display Fire extinguisher ABS Kit installation Racelogic video camera system	23-25 37 39 40-41 42 43
V7	31.07.3024	Launch limiter setup Tire circumpherence setup Display “full” function adjustment added Powerbox diagnosis added Gateway information added	19 20 43 44-46 48