TOPOLOGY OF ELECTRICAL SYSTEMS

Objective

- ⇨ **Maximum reliability** for vital systems
- ⇨ Dashboard and monitoring reduced to **the necessary**

Composition of the harness

- **DTA S80 ECU**
- **Gear control box**, composed of an Arduino Mega and a custom shield sealed in a Polycarbonate box aimed to control the brushless servomotor
- **Dashboard control box**, composed of an Arduino Mega sealed in an ABS box, aimed to transmit data between the CAN Bus and the dashboard
- **Carbon dashboard**, embeds all the necessary lights and buttons and minimizes the electronic elements sensitive to outdoor conditions.
- Littlefuse sealed **hard-wired power distribution module**, composed of simple relays and fuses
- Lightweight and compact SuperB **LiFePO4 battery**

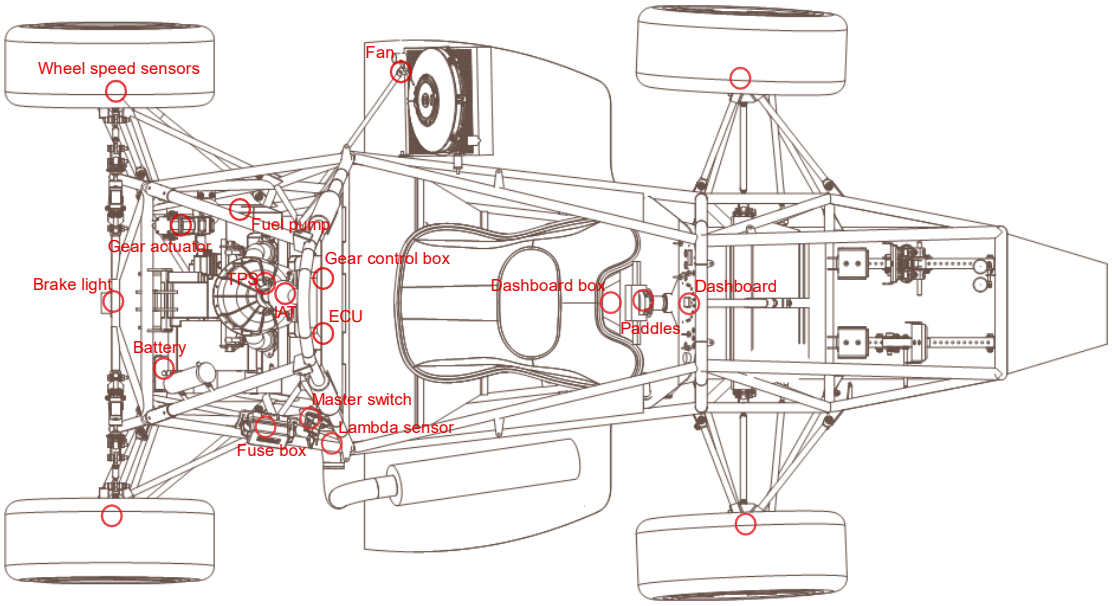

Figure 1: Position of electrical systems in the car

Vital systems are hard-wired in the harness whereas secondary data is transmitted through a CAN bus.

Data management

A **CAN BUS** is aimed to exchange data between the ECU, the gear control box, and the dashboard box.

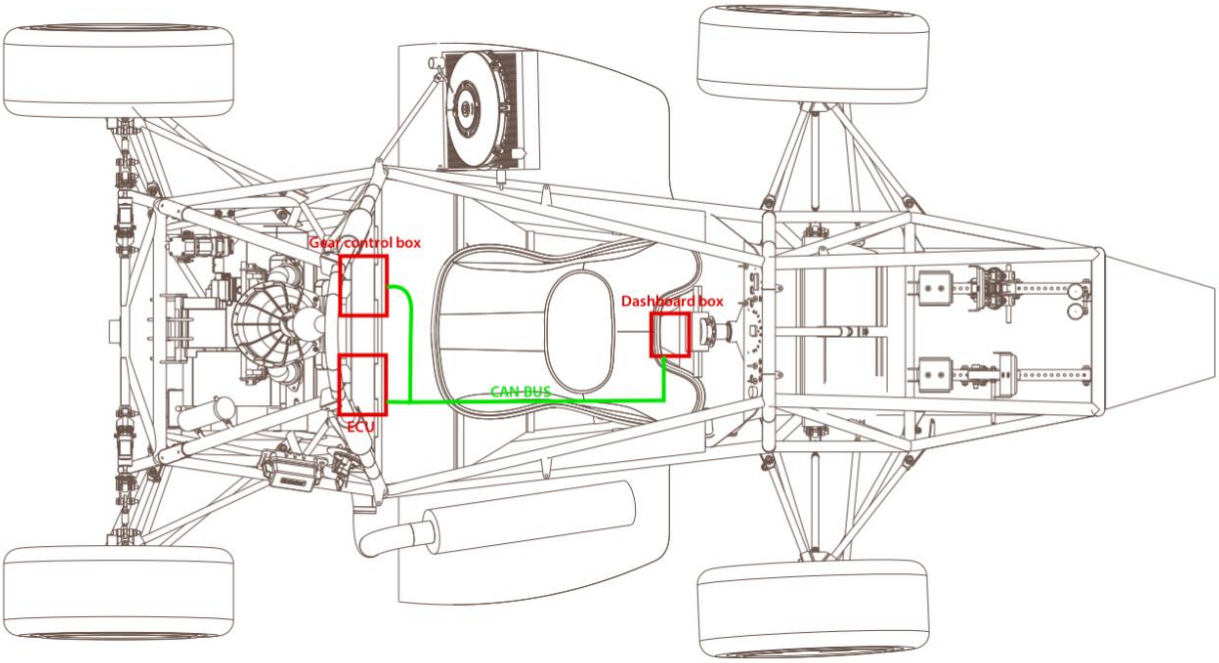

Figure 2: CAN bus implementation in the car

Emission ⇧ and reception ⇩ through CAN

ECU	Dashboard box	Gear control box
⇧ Water temperature ⇧ RPM ⇧ Oil pressure	⇧ Neutral button ⇧ Servomotor homing button ⇩Water temperature ⇩ RPM ⇩ Oil pressure ⇩ Engaged gear	⇩ Neutral button ⇩Servomotor homing button ⇧ Engaged gear

Hard-Wired data

- Gear shift
- Traction control, launch control, log switch and injection map selection buttons
- Shift light
- Engine start
- Fan control
- Neutral light

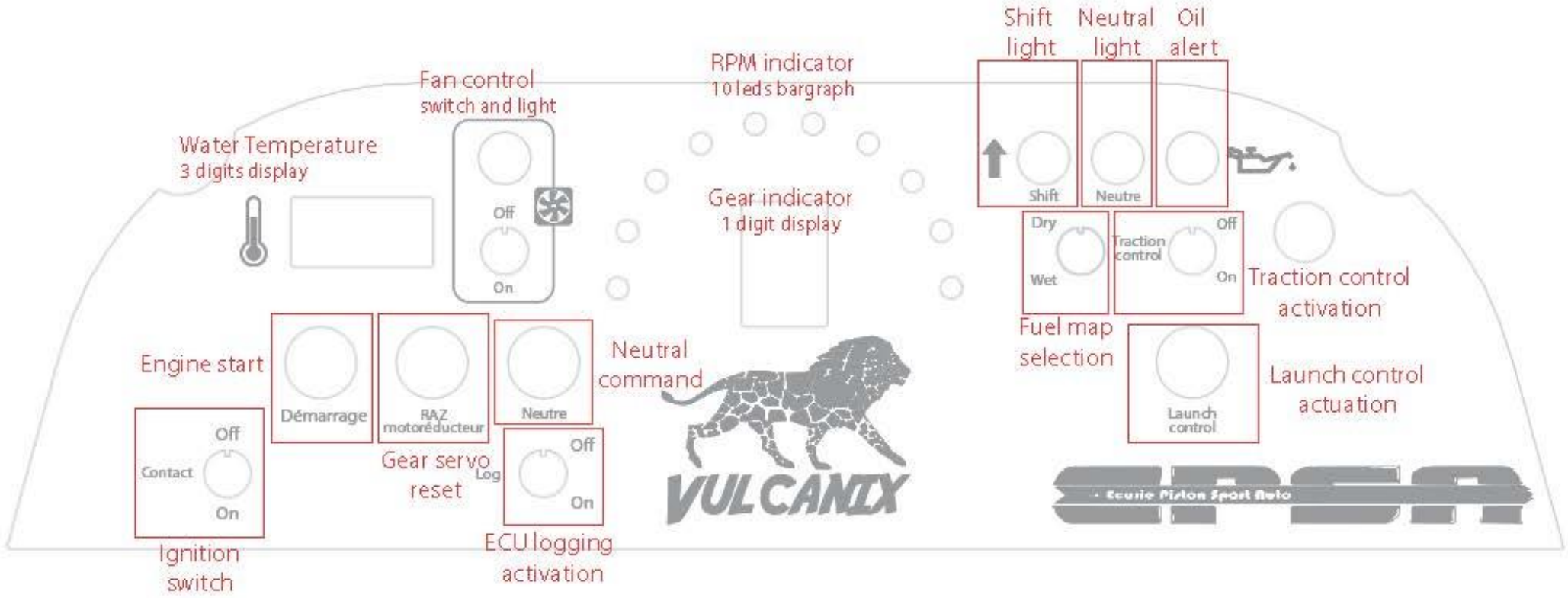

Figure 3: Dashboard composition

ECU choice

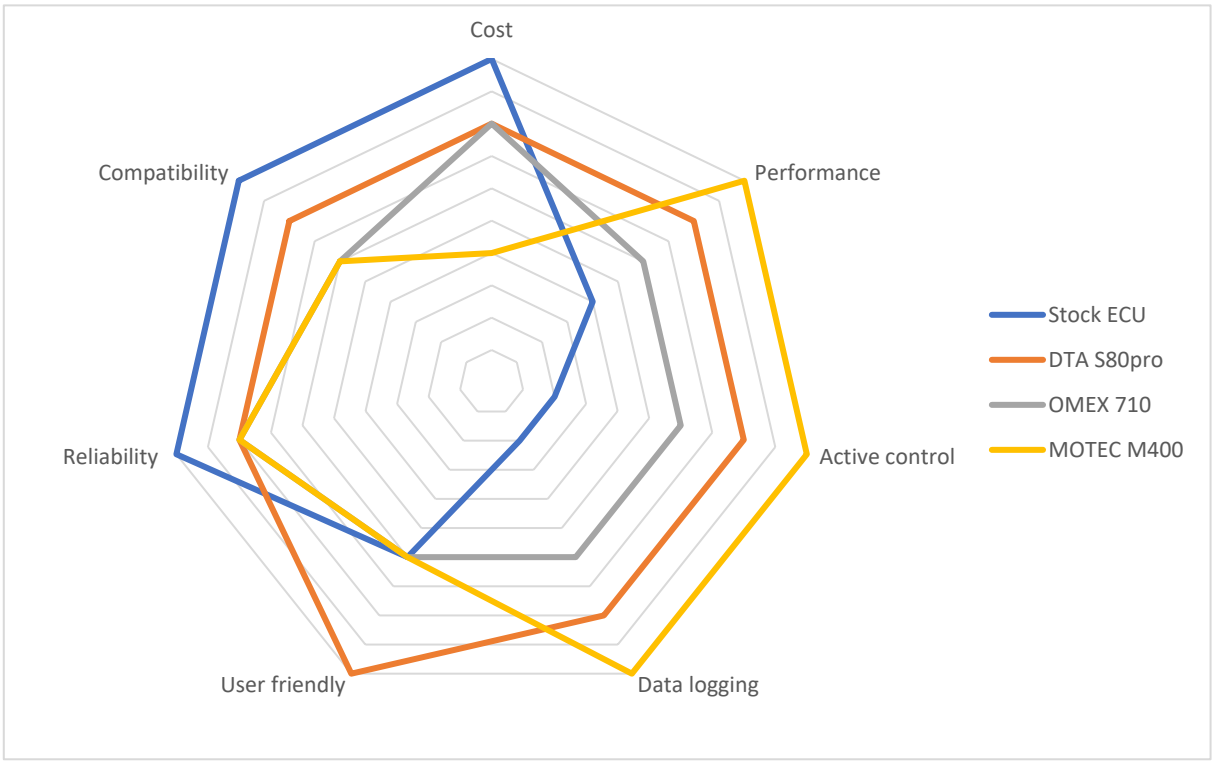

Figure 4: Comparison of different ECU available

DTA S80 pro

- Sequential fuel and ignition with 3D maps
- Correction with air and water temperature, throttle transients
- Fuel starting map
- Compatible with engine and genuine sensors
- Idle control
- Simple software
- Lambda sensor input
- Data logging up to 100Hz
- Shiftcut, launch and traction control