ADS-DV Compute Platform - 2025 Design Specification

Contents

Introduction

For the 2025 FSAI competition in Silverstone, teams will be able to bring their own compute platforms and integrate them into the ADS-DV vehicle. This will allow teams to pre-test their autonomous driving software on their own compute platform and give confidence that the software will perform as expected during the competition, reducing the impact of switching to the built-in compute platform at the event.

The following description provides early description of the design rules for team-supplied compute platforms.

- The 4 existing AI-PCs have been mounted onto a standard mounting plate, and will be available on all cars to allow teams to continue to use them where required.
- New connections have been created to allow quick removal of the existing AI-PCs and installation of alternative compute platforms which are pre-mounted on a standard mounting plate.

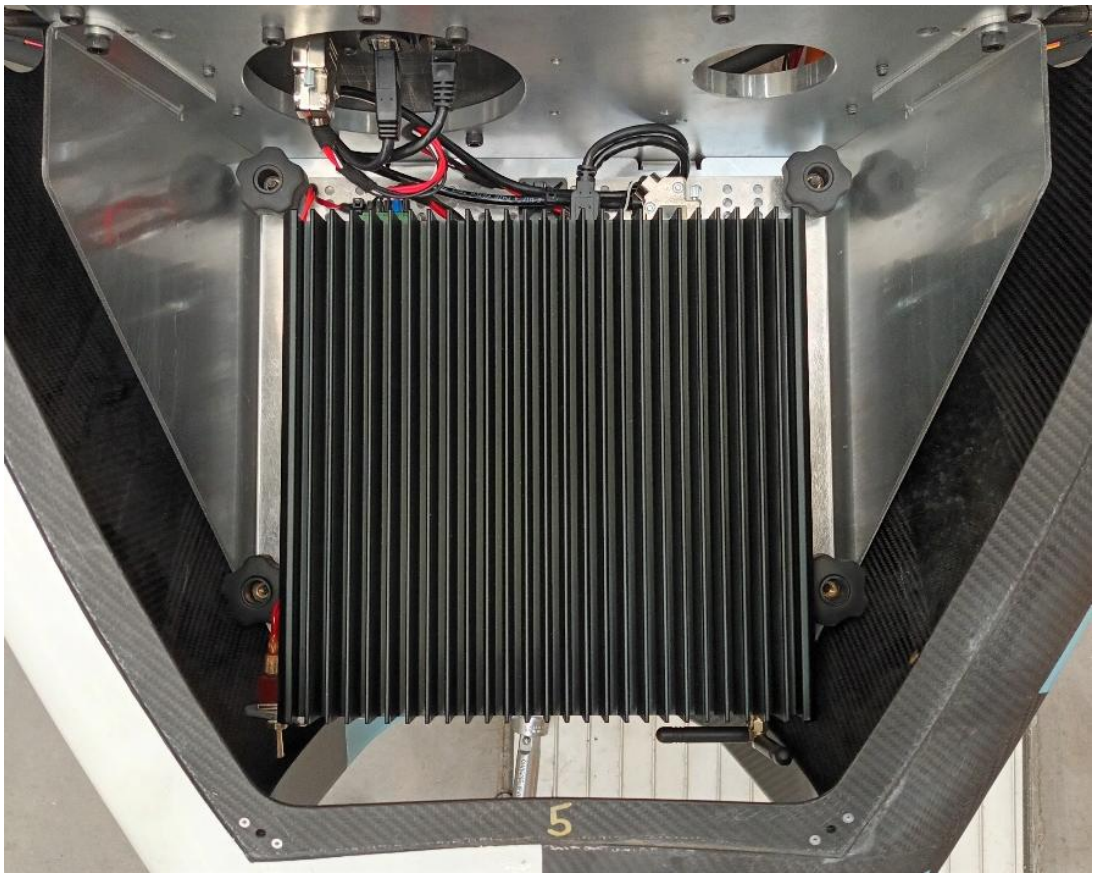


Figure 1 – Rear Compute Mounting – with InCar PC Installation

Specifications

Mechanical Specification

Rear Mounting Plate	Teams need to manufacture a mounting plate with the dimensions shown in Figure 3. This mounting plate will then have the compute platform installed on it to allow quick installation and removal. Plate Thickness (E): minimum 2mm.
Rear Mounting Hardware	The vehicle will have 4 mounting posts with quick-release clamping knobs. The compute should be installed on the mounting plate so that space is available for the quick release fasteners. Mounting posts Diameter: 6 mm. Mounting fastener clearance spacing: See Figure 3
Rear Compute platform dimensions	In order to leave room for the mounting Max Compute Size: See Figure 2 *Note: No part of the compute platform should extend above the rear vehicle bodywork panel.* *Note: If more room is required than shown in Figure 2 for the selected compute platform, a STEP file can be provided for more detail of the available volume.*
Rear Compute Platform Weight	Maximum weight: 8kg (including mounting plate)
Vibration Isolation	The mounting plate will be mounted rigidly to the vehicle chassis. Teams should consider the requirements for Anti Vibration mounts to decouple the compute platform components from the mounting plate.

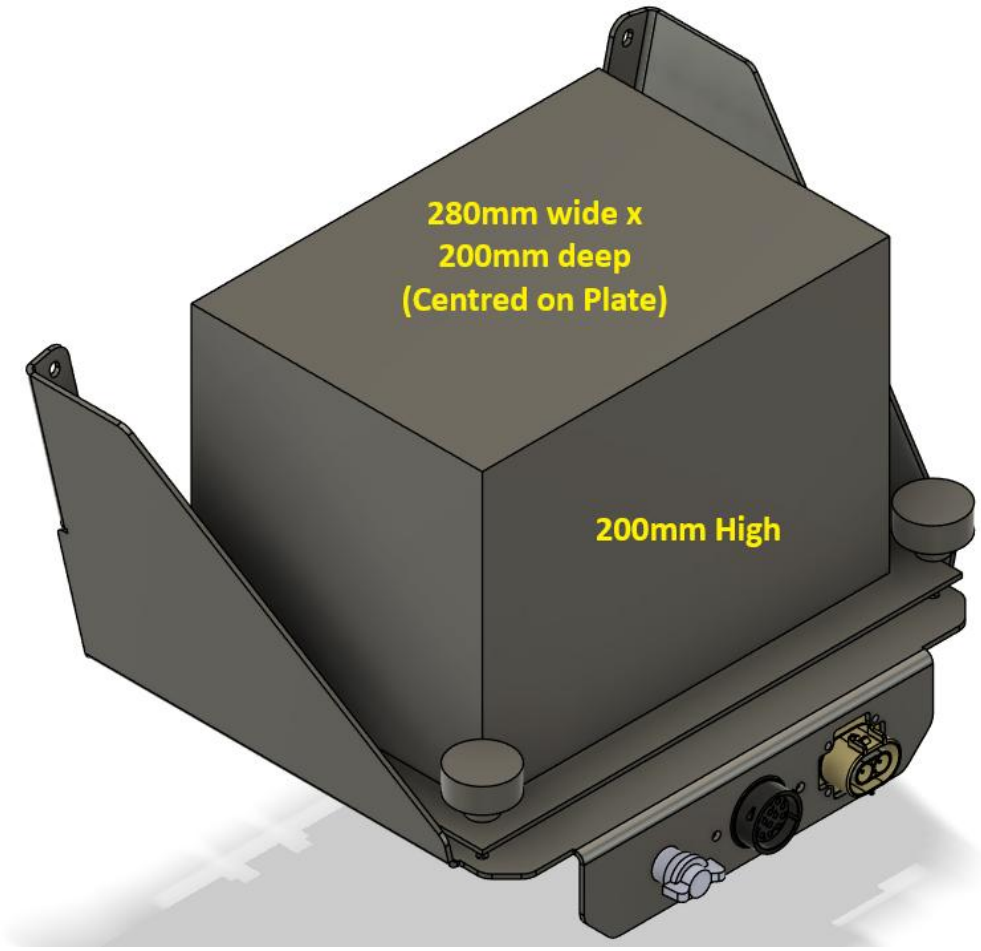


Figure 2 – Rear Compute Clearance 3D View

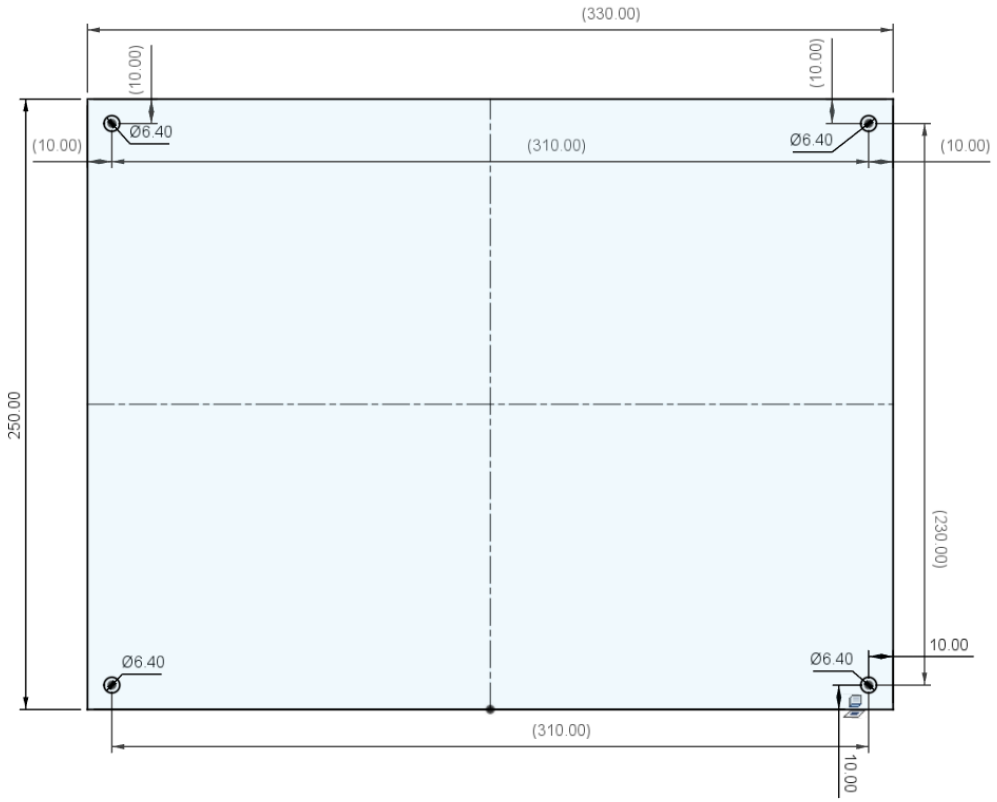


Figure 3 – Rear Compute Plate Dimensions

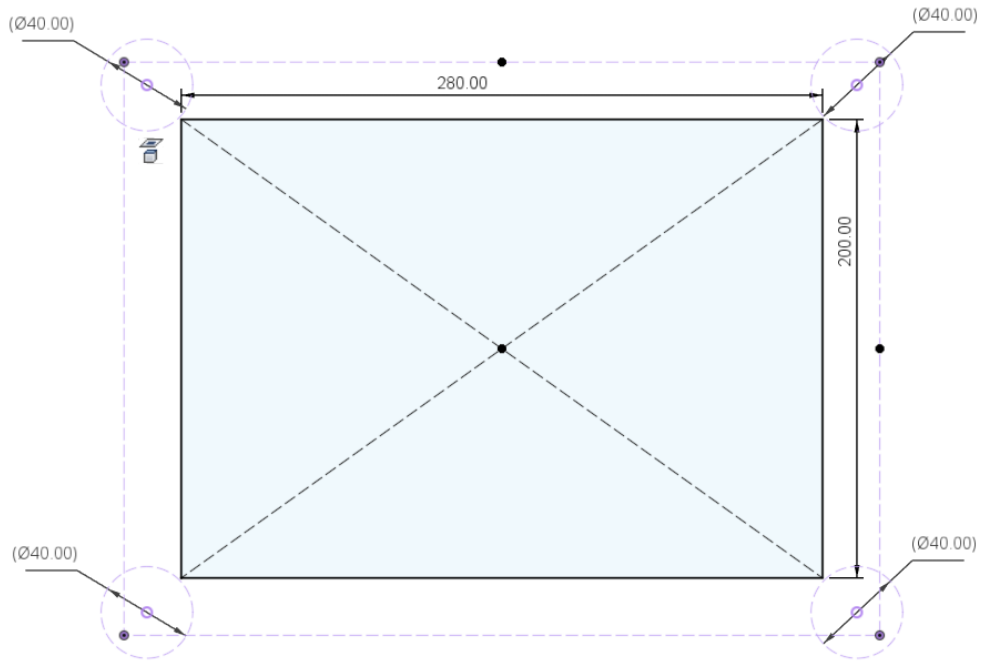


Figure 4 – Rear Compute Clearance Plan View

Electrical Specification

The vehicle connections for the compute platforms will be provided based on the following specifications.

Front Sensor Plate / Compute Connections

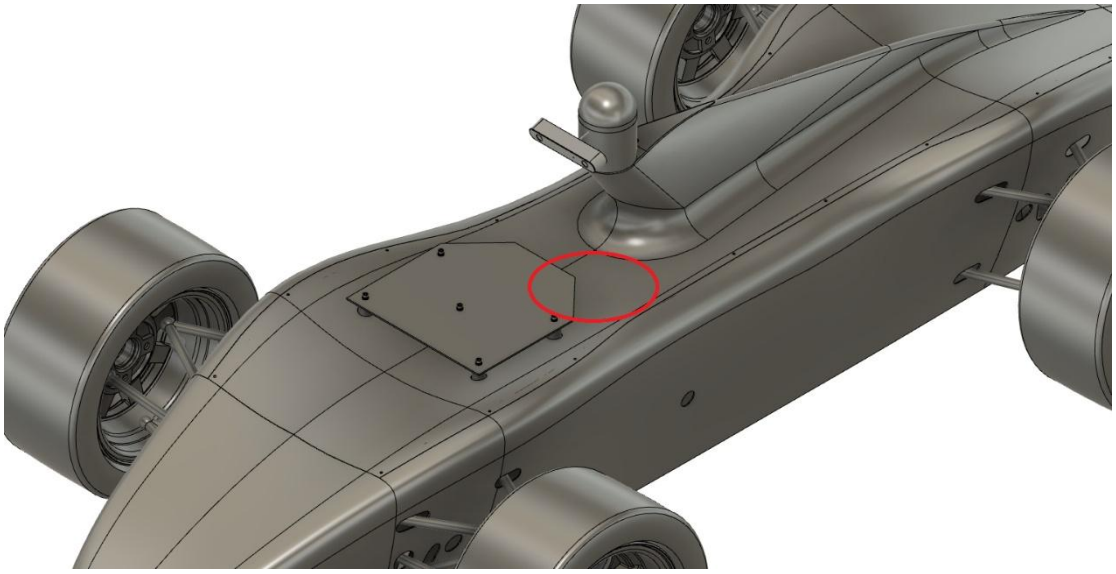


Figure 5 – Front Sensor Plate / Compute Connection Location

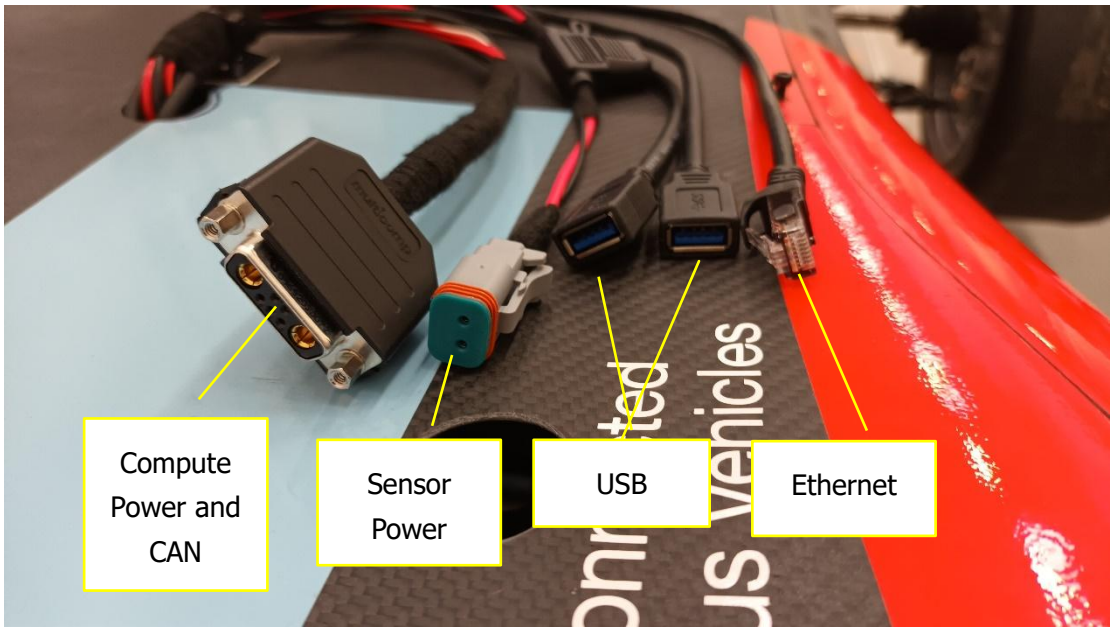


Figure 6 – Front Sensor Plate / Compute Connections

Connection	Specification
Front Compute Power and CAN	**Connector**: Mixed Signal D-sub (2 power, 5 signal) socket. **Socket Part Number (Vehicle)**: Harting 09 69 202 0072 (e.g.RS 693-0982) – Crimp Type or Norcomp 680M7W2203L401 (e.g. RS 174-8736) – Solder Type **Plug Part Number (Compute Platform)**: Harting 09 69 212 0072 (e.g. RS 693-1026) – Crimp Type (for Harting crimp pin information, see Table 1) or Norcomp 680M7W2103L401 (e.g. RS 174-8727) – Solder Type **Pinout**: see Figure 8. **Power:** - **Voltage**: 13.7V Nominal - **Maximum Current**: 30A (protected by fuse). *Note: The front/rear compute power and sensor plate power will be provided via the same 30A fused supply. Total combined current draw from both front and rear compute platform and sensor plate connections should not exceed 30A.* **CAN:** - This will give access to the existing vehicle Standard CAN interface with 500kbps baud rate. Teams will need to provide and integrate a CAN interface into their compute platforms. - The CAN network is fully terminated in the vehicle. No additional CAN termination is required in the sensor plate or compute platform.

Front Sensor Power	**Connector (Vehicle)**: 1x TE DT06-2S power connector supplying automotive '12V' (11.5 ->14.5V depending on battery charge state). **Mating Connector (Sensor Plate)**: TE DT04-2P. **Pinout**: Pin 1 = 12V and Pin 2 = Gnd **Voltage**: 13.7V Nominal **Maximum Current**: 10A (protected by fuse). *Note: The front/rear compute power and sensor plate power will be provided via the same 30A fused supply. Total combined current draw from both front and rear compute platform and sensor plate connections should not exceed 30A.*
Front Ethernet	**Connector**: Ethernet Cat6 cables with the standard RJ45 connector running to the rear Ethernet port (for connection to InCar PC or Team Supplied Compute Platform)
Front USB	**Connector**: 2x USB3.0 Type A sockets connected via a powered USB3.0 hub to the Rear USB Port (for connection to InCar PC or Team Supplied Compute Platform)

Rear Compute Connections

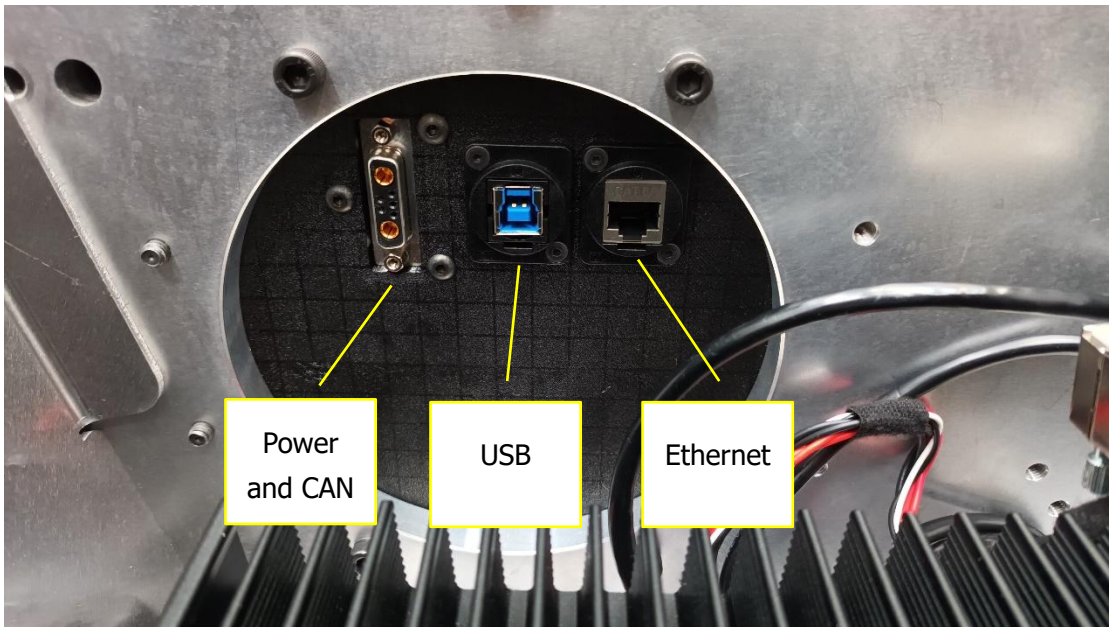
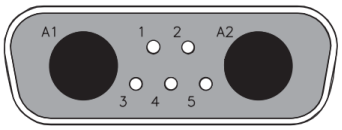


Figure 7 – Rear Compute Connections

Connection	Specification
Rear Compute Power and CAN	**Connector**: Mixed Signal D-sub (2 power, 5 signal) socket. **Socket Part Number (Vehicle)**: Harting 09 69 202 0072 (e.g.RS 693-0982) – Crimp Type or Norcomp 680M7W2203L401 (e.g. RS 174-8736) – Solder Type **Plug Part Number (Compute Platform)**: Harting 09 69 212 0072 (RS 693-1026) – Crimp Type (for Harting crimp pin information, see Table 1) or Norcomp 680M7W2103L401 (e.g. RS 174-8727) – Solder Type **Pinout**: see Figure 8. **Power:** - **Voltage**: 13.7V Nominal - **Maximum Current**: 30A (protected by fuse). *Note: The front/rear compute power and sensor plate power will be provided via the same 30A fused supply. Total combined current draw from both front and rear compute platform and sensor plate connections should not exceed 30A.* **CAN:** - This will give access to the existing vehicle Standard CAN interface with 500kbps baud rate. Teams will need to provide and integrate a CAN interface into their compute platforms. - The CAN network is fully terminated in the vehicle. No additional CAN termination is required in the sensor plate or compute platform.
Rear Ethernet Port	**Connector**: RJ45 Socket The existing Ethernet connection routed from the sensor plate location will be terminated with an RJ45 socket. Teams will need to provide an RJ45 patch lead to connect their compute platforms to the ethernet connection.
Rear USB Port	**Connector**: USB 3 Type-B Socket

	The existing USB connection routed from the vehicle sensors (e.g. for connection to the ZED Camera) will be terminated with a USB3–Type B socket. Teams will need to provide a USB3 cable with the following end connector types to connect their compute platforms: - compute platform – USB 3 Type-A Plug - vehicle connection – USB 3 Type-B Plug



Front view of the connector on the Compute side

CHECK PIN NUMBERS ON THE CONNECTOR!!!

CHECK POWER POLARITY WITH A MULTIMETER BEFORE CONNECTING COMPUTE PLATFORM!!!

Pin	Description
A1	+12V Power Supply (30A max).
A2	0V Power Supply.
1	CAN-H.
2	CAN-L.
3	Reserved.
4	Reserved.
5	Reserved.

Figure 8 - Power and CAN connector Pinout

Pin Type	**Harting Part No.**	**e.g. Supplier Stock Numbers**
Power (30A Max)	09692825422	Mouser: 617-09692825422
Power (20A Max)	09692825421	Farnell: 2752369 Mouser: 617-09692825421
Signal (Option 1)	09670008177	RS Stock No: 741-2839 Farnell: 2752325 Mouser: 617-09670008177
Signal (Option 2)	09670008576	RS Stock No: 755-3845 Farnell: 2084551 Mouser: 617-09670008576

Table 1 – Compute Power and CAN Plug - Crimp Pin Information