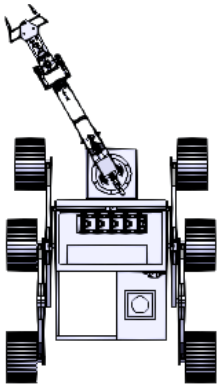
Project proposal

Title: IP64 Rover Chassis
Supervisor: Pr. Auke Ijspeert (Biorob)
Timeframe: Spring 2021

EPFL Xplore is an interdisciplinary project whose aim is to design and develop a Rover to participate in two international competitions: the University Rover Challenge and the European Rover Challenge. As contests, these competitions ask the rover to pass 4 outdoor missions and therefore it needs to show a certain degree of shielding against natural hazards.

Project description

Problematic



The rover is composed of multiple bays hosting electronic devices, batteries, motors, scientific instruments and other sensitive components. Thus, the student will have to design a chassis with accessible compartments that allow for dust and water shielding. By means of the design, the rover shall comply with the IP64 standard resulting in a close to complete shielding of the interior of the rover. Certain parts of the rover such as the avionics and the science may need to be removed between missions and therefore the interfaces shall be studied to enable the operator to simply retrieve a module without too much complexity.
The design shall also be optimized to limit the overall weight of the chassis.

Requirements

[1] The chassis shall comply with the IP64 standard.
[2] The chassis shall allow the AV bay and power bay to be easily accessible.
[3] The chassis shall allow for 12 cables to come out from the top.
[4] The chassis shall not weight more than 4.5 kg.
[5] The chassis shall not have a surface greater than 700*600 mm.
[6] The chassis shall not cost more than CHF 2’500 (raw material and manufacturing included)

[7] The chassis shall allow for the ventilation of the Avionics
[8] The chassis shall support the weight of the robotic arm at the front and the science bay at the rear (a FEM analysis shall be performed).

Reference documents

[1] IP64 Protection Index : https://en.wikipedia.org/wiki/IP_Code

Contact

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