The winner was again the Warr Hyperloop team

The winner of the second Hyperloop Pod Competition was gain the German team from the Technical University of Munich (TUM). Three CAN-networked devices controlled the winning pod.

The winning Warr Hyperloop team with Elon Musk, founder of SpaceX and Tesla (Photo: TUM)

In order to accelerate the development of functional prototypes and encourage student innovation, SpaceX announced the Hyperloop Pod Competition in 2015, which challenges university teams to design and build the best transport Pod. The first two competitions were held in January and August 2017. The Warr Hyperloop team won the second competition. Just the maximum speed mattered. The winning pod achieved a top speed of 234 km/h. The 1,25-km test tube in Los Angeles was just built for this competition. The tube is depressurized, reducing air resistance during the high-speed run.

The Warr scientific workgroup for rocketry and space flight, a student organization at the TUM, has around 200 student members active in all fields of astronautics. Besides the Hyperloop project, the group has over 50 years experience developing rockets, building satellites, and designing space elevators. In order to attain the highest possible speeds, the team developed its own drive system using a 50-kW electric motor. They also implemented pneumatic muscles that press the drive-wheel against the track for optimized power transmission. The system is comparable to the spoiler on a racecar, which pushes the car down onto the road, preventing wheel-spin. The pad's drive system accelerates it to a maximum speed of 350 km/h. Furthermore the young inventors emphasized lightweight construction, creating the entire structure out of carbon fiber. The pod weighs a total of only 70 kg.

The controller comprises three CAN-linked micro-controllers implemented on an application-specific printed circuit board (Photo: TUM)

The vehicle is equipped with 38 different sensors that provide relevant information such as position and temperature to various components of the capsule during travel. They constantly assess the state of the pod, measuring everything from battery voltage to braking pressure. Three CAN-networked micro-controllers on a printed circuit boards share the work of pod control. The brake system uses four pneumatic brake calipers, which can still be activated even in case electric power is lost. When the brakes are fully applied at 350 km/h, the pod comes to a standstill in only five seconds. A built-in stabilization system that always keeps the pod at the center of the tube also ensures optimum travel through the tubes.

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