



## **MAHINDRA RACING FORMULA E TEAM SEEKS COMPETITIVE ADVANTAGE WITH CRUDEN SIMULATOR**

*New Formula E simulator will test powertrain developments and Formula E energy management strategies thanks to easy integration of the ECU and Mahindra's vehicle model.*

**AMSTERDAM** – Cruden B.V., the world-leading designer, manufacturer and integrator of open architecture driving simulators, is building a simulator for the Mahindra Racing Formula E team. This is Cruden's first bespoke Formula E simulator, with the ECU and controls of an actual Formula E racing car. The Cruden package comes with Panthera simulator software that allows Mahindra's existing vehicle model, which is also used for lap time simulation, to be integrated and used as a real-time driver-in-the-loop (DIL) simulation model, as well as access to a full library of Formula E street circuits.

The new simulator is ideal for Formula E teams looking for ways to extract optimum performance from their electric powertrains yet who are new to using a professional-grade DIL simulator as part of their performance engineering. Mahindra Racing's engineers will use the simulator to prepare for upcoming races, finding how to optimise energy management by testing various settings, strategies and race scenarios. Having a driver-in-the-loop is essential to the realism of these tests.

Between seasons, Mahindra Racing's engineers will use the simulator to assist with development of software managing the electric powertrain. As Mahindra Racing's chief engineer, Vinit Patel, explains: "An electric powertrain is only as good as its inputs. Good controls-software and great controls-strategies are vital to achieving the best performance from the hardware. Software development is becoming the holy grail of Formula E."

Cruden's new simulator will also give a critical competitive advantage to Formula E drivers. One of the unique challenges of driving a Formula E car is the complexity of the controls needed to alter the characteristics of the electric powertrain while the car is on the move. During a race, the driver has to monitor and adjust the car's energy consumption, energy regeneration, battery temperature and optimum engine speed for gear-shifts. This is all done with the steering wheel which has an integrated dashboard display and 21 rotary controls, paddles and buttons. The steering wheel is connected to the ECU which is integrated with the simulator as hardware-in-the-loop (HIL).

Seat-time will also help drivers learn or become re-acquainted with track layouts. Cruden produces accurate reproductions of all the tracks visited by the Formula E Championship which are temporary street-based circuits in city centres, unavailable for real-world testing.

Mahindra Racing's technical director, Lewis Butler, said: "A professional simulator is needed to ensure that our energy strategies are correct and that our drivers are familiar with all the controls procedures and options before we get to the track. After researching all options, we concluded that a Cruden simulator will provide the best balance between cost and technical benefit. It's important that we are able to integrate the simulator with our

existing vehicle model. Cruden is a skilled system integrator with a detailed understanding of racing operations which gives us a great deal of confidence.”

Cruden CEO, Maarten van Donselaar, commented: “Automotive technology, on both the race track and on the road, is moving towards increasingly sophisticated electric and hybrid powertrains and Formula E is a good example of this. It’s a championship in which energy management can be the deciding factor when it comes to winning or losing a race. In this respect, Cruden’s new Formula E simulator certainly provides teams with a crucial competitive advantage.”

Motorsport teams in any formula that are interested in learning more about Cruden simulators and simulator software for motorsport, should contact Dennis Marcus via [d.marcus@cruden.com](mailto:d.marcus@cruden.com).

### **About Cruden**

Cruden is the world’s leading designer and manufacturer of professional, open architecture HIL/DIL driving simulators, simulator components and software. Originating from Fokker Aircraft Company in the late 1990s, Cruden was formed in 2004 and today serves the automotive, motorsport and marine industries. The company’s complete simulator packages interface with any customer vehicle model and include on- and off-board projection systems. Cruden also produces vehicle, road/track and tire models in-house. The company launched its open architecture Panthera software suite in 2015. [www.cruden.com](http://www.cruden.com)


### **About Mahindra Racing**

Mahindra Racing is one of ten founding teams – and the only Indian team – to compete in the FIA Formula E Championship, the world’s first all-electric racing series. The M3Electro race car, launched for season 3 which concluded in July 2017, proved to be a competitive package getting the team’s first race win, a total of ten podiums, three pole positions and two fastest lap awards. With these strong results, Mahindra Racing secured third place in the Teams’ Championship and rookie driver Felix Rosenqvist took third in the Drivers’ Championship. For Season 4, commencing in Hong Kong in December 2017, the team has high technical and sporting ambitions with its newly developed M4Electro race car that pushes the limits of technology and innovation. Visit us at [mahindracing.com](http://mahindracing.com)

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### **Images**

	<p>Cruden B.V. is building a simulator for the Mahindra Racing Formula E team.</p>
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