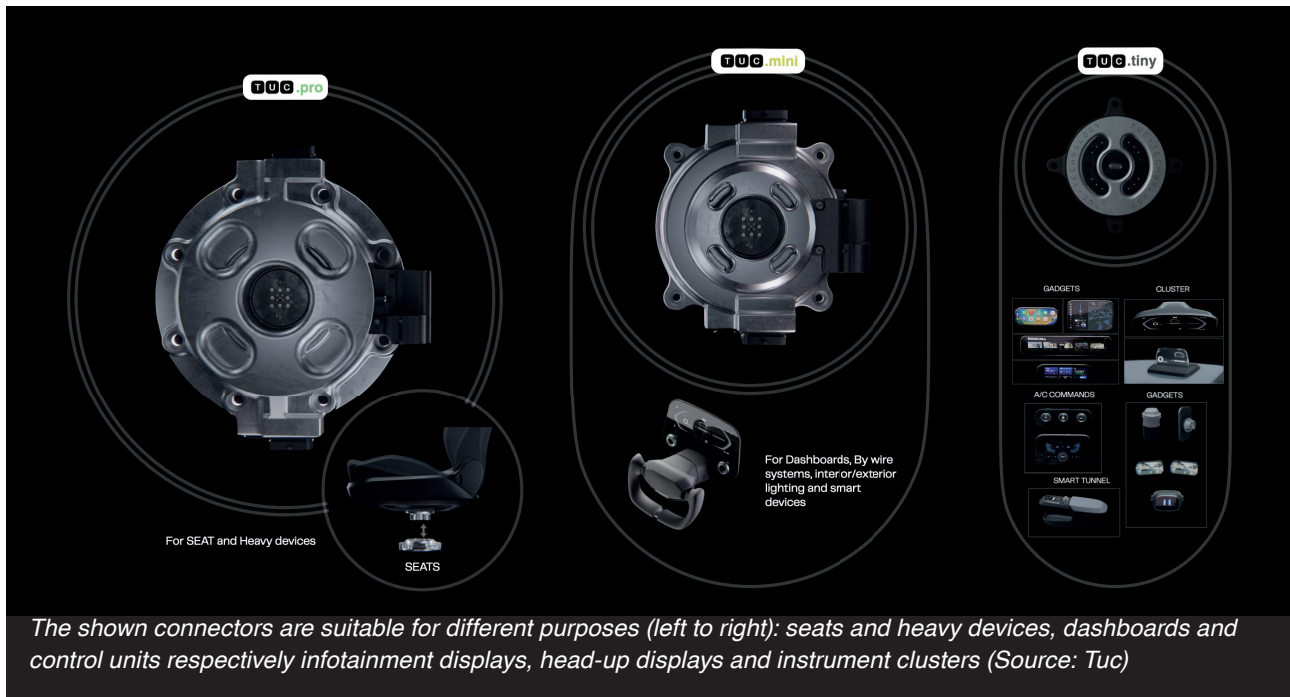


Three types of automotive connectors



The shown connectors are suitable for different purposes (left to right): seats and heavy devices, dashboards and control units respectively infotainment displays, head-up displays and instrument clusters (Source: Tuc)

At the CES 2025 tradeshow, the Italian company Tuc exhibited its automotive connector family, which can be used to connect CAN-interfaced devices to wiring harnesses. There are available three variants. The products are mainly intended for vehicle-interior devices.

All three connector types share technical capabilities, including support for 9-V to 48-V electricity supply (like Tesla's Cybertruck), delivering up to 400 W of power to an attached device. Ethernet T1 is the default data interface, delivering up to 1 Gbit/s throughput. Additionally, the connector has some optional pins for CAN communication. The connectors provide common mechanical, electric, and communication interfaces. They can be pre-installed with the wiring harness.

A vehicle using these connectors can be upgraded with new devices. "Interfaces can be connected using a single cable to create the cabin of the future. The most important benefits are cost saving and customization," stated Ludovico Campana from Tuc. This comes from massive simplification of a car's wiring loom. "With traditional wiring, the same model can have 20 different cables, harness projects and typologies."

Campana also sees his company's technology streamlining and lowering the cost of developing new models, "We are telling automakers that they need to shift their ideas, especially in the mass market, because with this system, they can have a cheaper development process. Without different fragmented architectures and a single interface, they can smooth the chain of development. They can save around 20 % on their model development costs. Then they can open new component business on top of this."

Simplifying will be one benefit of connector standardization. "Another is enabling new business models like an App Store," said Campana. Just as you personalize your smartphone with different applications, having standard connectors could mean you can more easily change interior elements in your car, such as the seats, steering wheel, and infotainment interfaces. "We are like the second wave of the trend Tesla started," explained Campana. "But they are focused on screens. We are building the physical experience, not only a touch screen and interfaces. This is what makes it special because application functionalities and screen customization is cool but is not the complete answer for vehicles because they are objects that you need to live inside."

You can see where these developments are headed by looking towards the Chinese automotive market, which is increasingly focused on emerging technology rather than brand loyalty. When car buyers want the latest gadgets as quickly as possible like this, automakers need to be able to deliver with the shortest development cycle. "We can extend Tesla's vision because they have already made the car architecture simpler," says Campana. "We can help automakers do what Tesla is doing."

"We focused our technology on the cabin of the future, but it could also be applied to some exterior modularity, such as cameras and sensors," said Campana. "You could swap a conventional powered mirror for a camera-based ▶

90° cable entry

The Wellconn CAN-RCFM01 connector by Shenzhen Richlight Technologies (China) has been designed for CAN FD devices. It is suitable for bit rates up to 10 Mbit/s, coming in a galvanized metal housing. The termination resistor is integrated and can be enabled externally using a slide switch.



Source: Shenzhen Richlight Technologies

The connectors are suitable for CAN cables in accordance with CiA 303-1 and CiA 601-1. They feature an outside diameter of 5 mm to 8 mm. The products also can be connected to twisted cables without a shield.

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The concept is also suitable for other interior vehicle applications. This includes, especially, cabins of off-road and off-highway commercial vehicles. Those operator cabins are often application-specific. With the launched three connector types and a pre-installed wiring harness, the OEM (original equipment manufacturer) is able to support a high number of cabin variants. This could save costs caused by individual adaptations. Another application could be rail vehicles.

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system. The great potential of this technology is for mass markets. We spent six years making this happen. The lack of standardization is the problem, and we have the solution.”

“We now collaborate with three of the top five automakers,” reported Campana. “One we can mention is Hyundai Motor Group, which is looking at our open innovation platform. We are just a step before production and development.” This still means vehicles beyond concepts are a few years away.



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