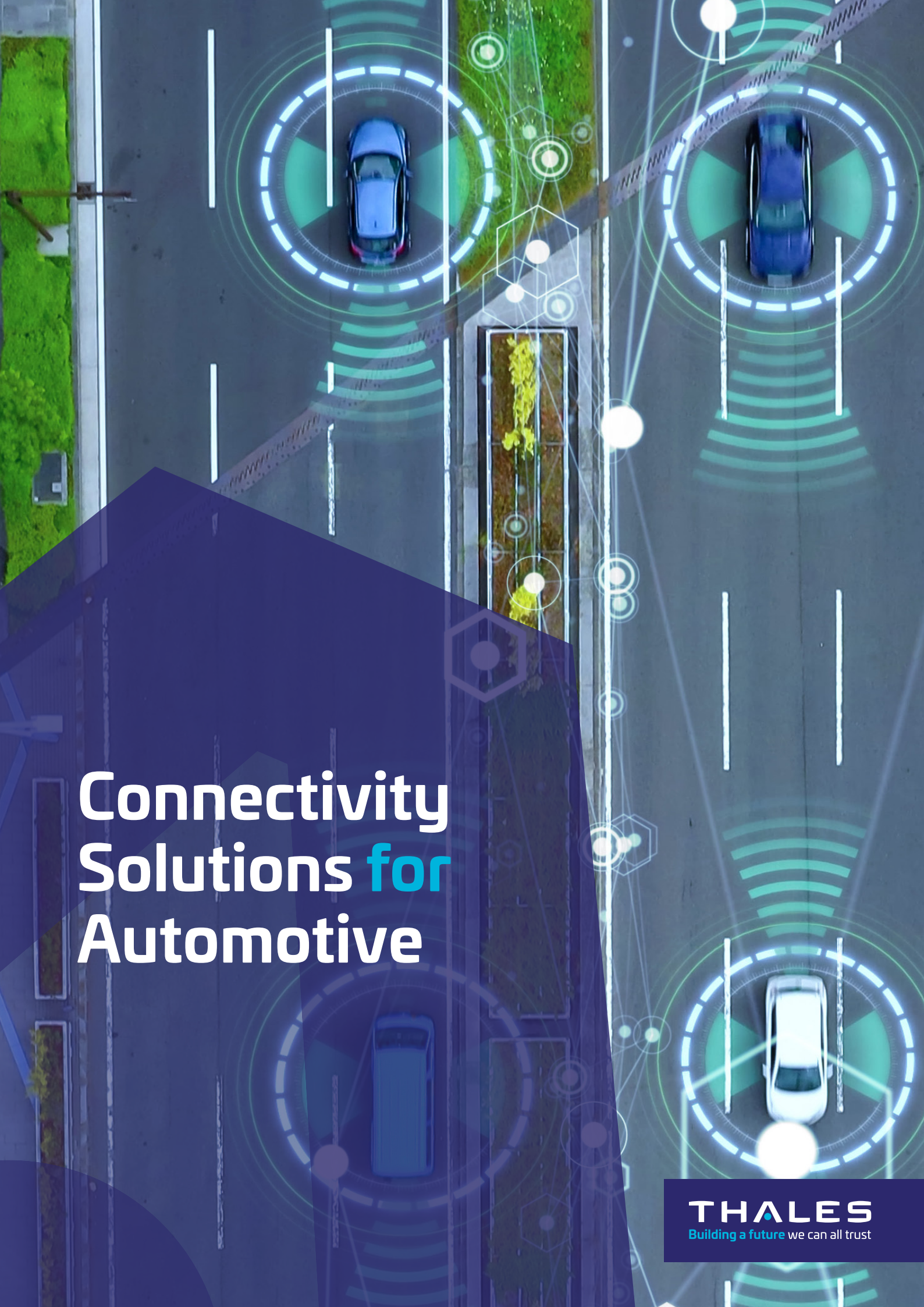


Connectivity Solutions for Automotive

THALES
Building a future we can all trust

Connectivity Solutions for Automotive

Mobile Connectivity Solutions

Ensuring 24/7 future-proof car connectivity

Today, mobile-connected technology is fully incorporated into virtually every aspect of our lives. The promise of a fully "connected car" inspires drivers, automakers and automotive service providers alike.

Car makers and automotive suppliers trust Thales to manage worldwide **cellular connectivity** in this context. With our advanced connected vehicle solutions, we make the increasingly connected automotive world secure and easy to control.

With more than **20+ years of experience** connecting vehicles, Thales customers benefit from its leadership position in mobile connectivity standardization, serving more than 450 mobile operators worldwide.

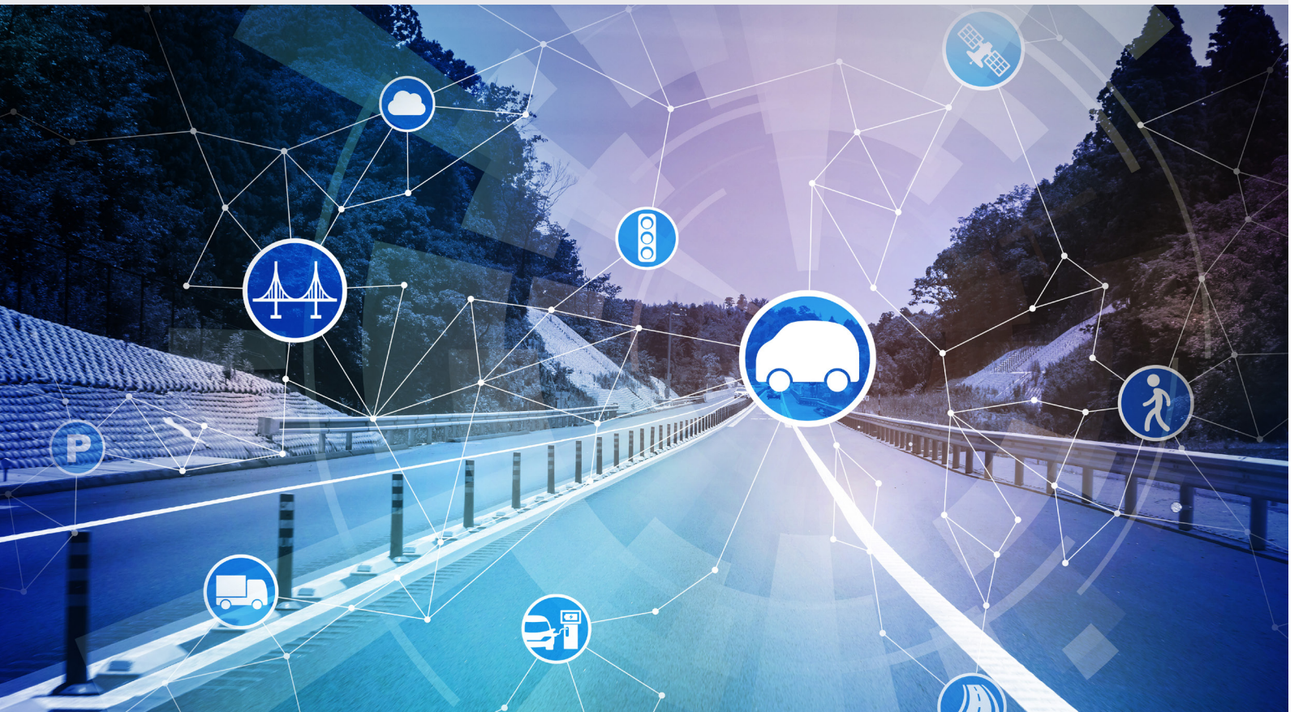
Global car connectivity solutions and remote management significantly reduce supply chain complexity for automotive OEMs while enabling more accessible end-user experiences over long vehicle lifecycles.

Future-proof connectivity supporting Software-Defined Vehicles

Car manufacturers and their Tier 1 suppliers need high-quality and future-proof connectivity to enable the connected car of the future – providing everything from telematics to preventive maintenance to accident prevention and enhanced entertainment systems.

At Thales, we guarantee reliable connectivity solutions and the required interoperability of integrated solutions to ensure 'always-on' connectivity throughout a vehicle's lifetime.

The added value of Thales connectivity is built on the unique combination of **eSIM (eUICC)**, and **OTA** (over-the-air) **platforms**, providing an end-to-end approach to deliver secure connectivity inside the vehicle.

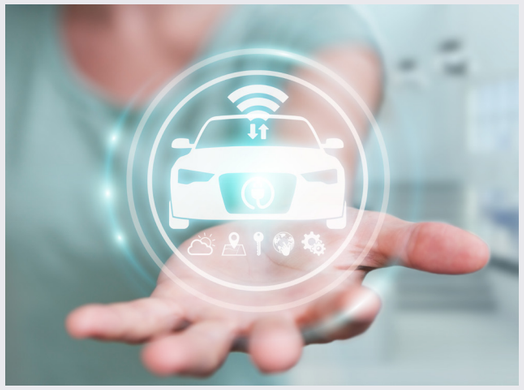


Automotive-grade eSIMs enable flexible connectivity

Thales' automotive-grade embedded SIM cards (eUICC) provide global connectivity for intelligent vehicle systems supporting the SGP.02 GSMA scheme.

The single and universal eUICC **simplify manufacturing and logistics** for global car OEMs. They can integrate a unique eSIM design across all vehicles, which can be remotely provisioned with a chosen mobile network operator (MNO) profile once the car is shipped or at the end of a connectivity contract.

Thales automotive eUICC also improve vehicle safety as they are integrated during manufacturing. In addition, they will further identify vehicles and encrypt communications while the car is in operation.
The automotive-grade eUICC are designed to endure extreme shocks, vibrations, temperature (-40 to +105 degrees C), and humidity for a long life span.



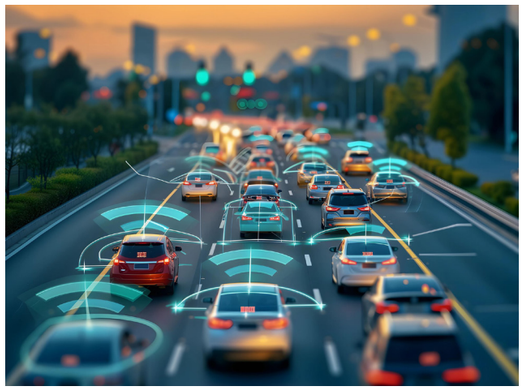
Supporting GSMA SGP.32

The automotive industry is eagerly looking forward to the future of connectivity, and the GSMA SGP.32 IoT standard is playing a crucial role in shaping this transformative journey. Automotive OEMs are reaping the benefits of this advancement as it removes friction from SGP.02 M2M for IoT Device & Automotive.

Some key aspects of GSMA SGP.32 are making waves on a global scale:

- GSMA SGP.32 builds upon the successful foundation of GSMA SGP.22 already massively deployed worldwide and adapts it specifically for the IoT landscape. This evolution eliminates the need for SM-SR and DP to be hosted by Mobile Network Operators (MNOs), streamlining operations and enhancing efficiency.
- One of the standout advantages of GSMA SGP.32 is the flexibility offered to Automotive OEM to manage the car connectivity. OEMs can seamlessly handle connectivity requirements, providing a seamless experience for both vehicle owners and service providers.
- The standard also offers simplified deployment for new MNOs entering the market, making it more accessible for diverse players to participate in the automotive connectivity ecosystem.
- GSMA SGP.32 employs a pull mode, ensuring immediate updates and changes as opposed to the traditional SMS push mode. This enhances responsiveness, enabling real-time adjustments and optimizations.
- With more granularity per country, GSMA SGP.32 allows for tailored implementation in different regions. This localization optimizes operational costs by aligning offerings with specific market demands and regulations.
- By limiting the number of entry points/interfaces, GSMA SGP.32 optimizes security and reduces potential vulnerabilities. This streamlined approach enhances data protection and safeguards against cyber threats.
- The market equipment rate for MNO GSMA SGP.22 DP+ is already high, reflecting the industry's readiness for the evolution of connectivity. The extensive adoption of these technologies showcases the strong foundation on which GSMA SGP.32 is built.
- As the automotive industry embraces these advancements, GSMA SGP.32 IoT is playing a significant role in shaping the future of connectivity, making Software-Defined Vehicles more seamless, secure, and robust in the global landscape

Thales provides solutions to support GSMA SGP.32. Through ongoing innovation and collaboration, we strive to enhance the overall connectivity experience for automotive stakeholders globally.



Moreover this new standard is designed to be future-proof, including in its scope features such as MEP* and IFFP**

** MEP (Multiple Enabled Profiles) means several Profiles can be in Enabled state. This enables a Device with more than one baseband to use more than one Profile at the same time for providing connectivity to different networks.*

*** IFFP (In-factory profile provisioning) means enable the provisioning of Bound Profile Packages on eUICCs in a Device factory environment*

Thales "On-Demand Connectivity" (ODC) platform: seamless car connectivity lifecycle management

"On-Demand Connectivity" is Thales' eSIM management platform designed to securely and remotely manage the lifecycle of cellular subscriptions:

- **Build once – Deploy anywhere:** eSIM-enabled cars can instantly connect with cellular networks anywhere on the globe - through quick and secure provisioning of MNO service - and transmit data over a wide range of mobile networks. This means a vehicle can be sold in different regions and operate in tunnels, underground, or remote locations without new factory settings.
- **Seamless connectivity subscription management:** Switching from one MNO to another becomes easier and doesn't require a new factory run.
- **Secure updates:** the eSIM provides a secure environment that only authorises encryption-based updates to be downloaded onboard.

With 200 deployments worldwide, Thales' eSIM management platform is a worldwide reference across mobile operators, operator alliances, and car manufacturers. In addition, the On-Demand Connectivity solution was the first in the world to be certified by the GSMA. It is thus compliant with the GSMA remote SIM provisioning specifications.

The Thales automotive connectivity solution enables drivers to securely access new mobility services anytime, such as advanced navigation, real-time updates on traffic and nearby amenities, vehicle diagnostics, emergency services, and much more.

With the eSIM technology and associated management services, car manufacturers can easily shift from mobile operator providers to mobility service providers.

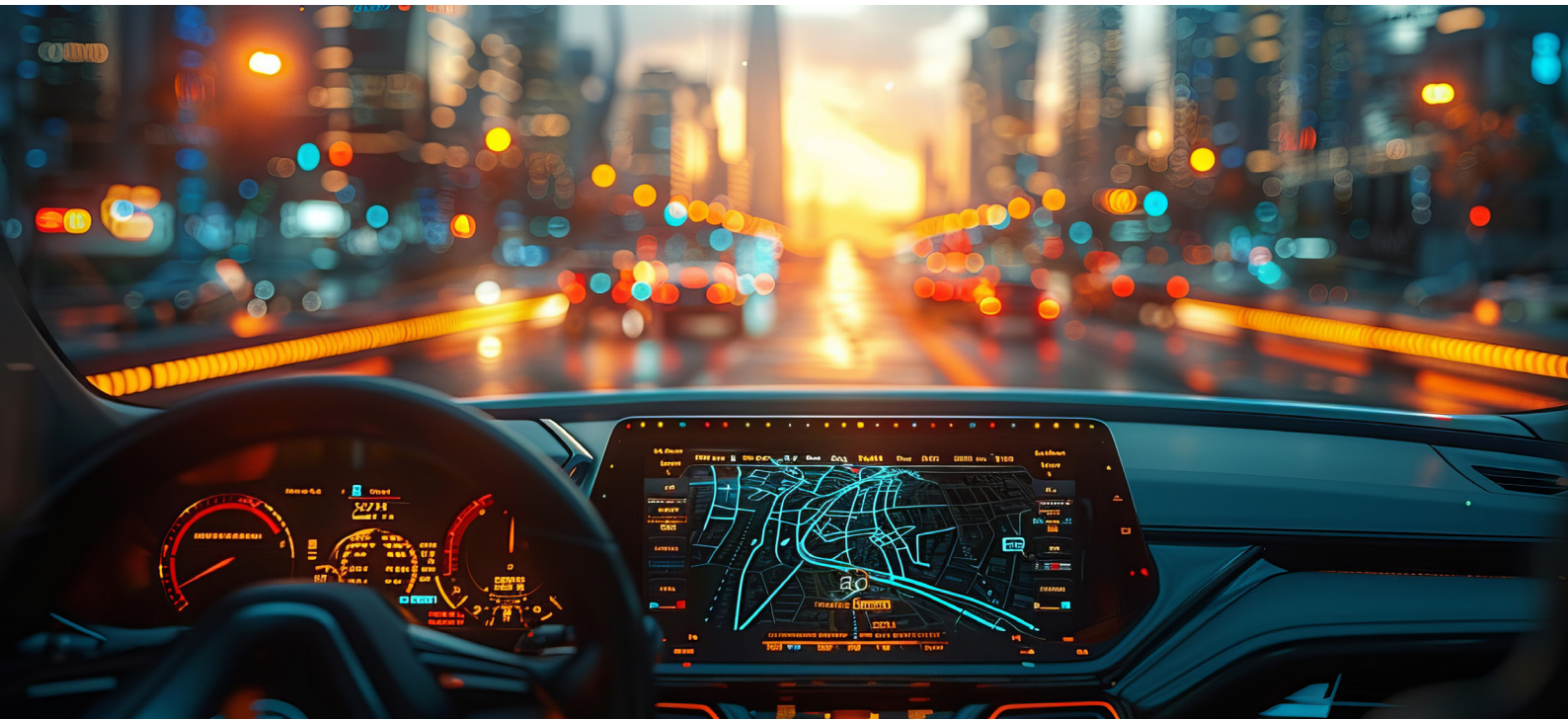
Connected car technologies and solutions

Industrial embedded eSIMs

Industrial versions of embedded SIMs, or eSIMs, are integrated into cars during manufacturing to enhance car security and connectivity flexibility.

eSIMs identify individual vehicles, encrypt communications and ensure secure global car connectivity for intelligent vehicle systems. These include eCall emergency solutions, vehicle telematics, navigation and more and are optimized to survive extreme environments (humidity or heat, for example).

eSIMs also enable secure and remote car connectivity provisioning services, significantly simplifying the manufacturing process and global connectivity deployment wherever vehicles operate. They provide great flexibility to select or swap mobile network service providers and service plans during the long life of connected cars.



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