Making Time in the Car, Time Well spent

Mobility is more than getting from one place to another. It’s about shifting from one state of being to the next. HARMAN ExP doesn’t just move people from one place to another, it delivers in-vehicle experiences that put people first, so time in the car, becomes time well spent.

HARMAN ExP bundles advanced technologies to deliver meaningful consumer experiences; enables OEMs to unlock new market opportunities; and empowers HARMAN to create value today while positioning our customers to thrive tomorrow.

HARMAN ExP maximizes consumers’ time and quality of life in four key consumer benefits:

- Accomplishment,
- Well-being,
- Social Connection, and
- Enjoyment.

SmartKey with BLE & UWB
At your service

Your chariot awaits

As we approach the age of the autonomous vehicle, new features are rolling out incrementally that will add to driver and passenger service and convenience. One of these features is the SmartKey. Like a chauffeur awaiting passengers, SmartKey stands at service to unlock the car doors, without the need to fumble for a key fob. With Bluetooth Low Energy (BLE) and Ultra Wideband (UWB), the car will be on the lookout for its driver. The driver carries a BLE/UWB-enabled smartphone or SmartKey. SmartKey will track the driver’s approach to the vehicle. When the driver is within a meter of the vehicle, the doors will automatically unlock. If the driver then walks away, the car will automatically relock.

Personalization and key sharing

The SmartKey Technology features a personalization token that is used by HARMAN’s Digital Cockpit to personalize vehicle settings including interior lighting, seat position, infotainment choices and passenger compartment temperatures. What’s more, using the Key Share mode, a key can be “sent” to another driver which will be allowed to unlock the car. Personalization, expiration time and other adjustments can be made to the shared token to control vehicle parameters. Tokens can be extended to home-based systems including locks and appliance personalization.

Safety & security in mind

UWB was designed for military ranging applications. Unlike traditional Remote Keyless Entry technologies which are exposed to relay attacks, Smartkey is almost impossible to hack. The key transaction is a two-way negotiation between the SmartKey and the vehicle and uses “time of flight” measurements between the SmartKey to validate the signal. Because the signal is wideband in nature, it is more difficult to intercept and duplicate. Furthermore, tokens comply with the IEEE 802.15.4a standard for an extra level of security.

Key highlights

SmartKey uses HARMAN Telematics including Bluetooth Low Energy (BLE) and Ultra Wideband (UWB) technologies

SmartKey automatically unlocks the car when the driver approaches and relocks when the driver departs

With SmartKey tokens, the keys can be personalized and shared to ensure that the car is configured for comfort and safety

Unlike conventional Remote Keyless Entry systems, SmartKey technology is almost impossible to hack
HARMAN
More than 50 million automobiles on the road today are equipped with HARMAN audio and connected car systems. Our software services power billions of mobile devices and systems that are connected, integrated and secure across all platforms, from work and home to car and mobile. HARMAN’s latest innovations leverage Samsung’s connected lifestyle and hardware expertise, allowing automakers to create an ecosystem of unique, smart, enhanced and rich in-vehicle experiences. Together HARMAN and Samsung are architects of experience, designing the most intuitive and immersive interactions with in-vehicle technology. HARMAN is a wholly-owned subsidiary of Samsung Electronics Co., Ltd.
car.harman.com

SmartKey elements & specs

Automatically locks and unlocks as driver approaches or departs vehicle

Specifications

<table>
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<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Lock Activation</td>
<td>Locks activate (lock or unlock) at 1-2 meters from car depending on the direction of approach. Ultra Wideband scanning triangulates on the driver as an approach to the car is made.</td>
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<td>Triangulation</td>
<td>When the driver is within 10 meters of the car, the UWB begins to track the driver’s approach. Bluetooth Low Energy (BLE) is a low power sentry listing for the driver’s arrival.</td>
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<td>Low Idle Current Drain</td>
<td>SmartKey’s in vehicle radio maintains a listen-only posture to ensure a low power consumption. Peak idle consumption is under 4 mA (20 mW) in listen-only standby mode.</td>
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<td>Robust Application</td>
<td>The SmartKey companion app lets drivers share keys, set limits, locate vehicle and control lights. May be combined with similar SmartKey systems in the home to control appliances.</td>
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<tr>
<td>Secure from Hacks</td>
<td>Complies with IEEE 802.15.4a. Built with security in mind. Immune from relay attacks and other spoofing measures through encryption and time stamp validation.</td>
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