



## A Secure, Policy-based Vehicle Access and Safety Solution

A Strategic Partnership between Conjure and Irdeto

Digital vehicle key solutions are on the rise, creating additional convenience for vehicle users. Keystone takes the concept a step further. With defense in depth security on both the mobile app and the telematics gateway in the vehicle, Keystone makes it possible for owners to add policies to each key. In turn, these policies can enforce vehicle usage rules such as speed limit, time of use, geolock, access only to parts of the vehicle, and many more.

### MORE SAFETY, MORE SECURITY

Enforceable policies promote safety, such as around teen drivers, and vehicle security by setting limits on access and usage. The use cases for a policy-based vehicle access and safety system are abundant, but none of them will take off without in-depth cybersecurity. Make no mistake, vehicles are deployed into hostile environments, where cyber-criminals have access to critical hardware components, the luxury of time for crafting a hack, as well as the motivation driven by a large opportunity.

### KEYSTONE OVERVIEW

Keystone is a policy-based vehicle access system that utilizes a mobile device (e.g. phone or watch) with a companion application to eliminate the need for physical keys entirely. The Keystone system provides all of the components necessary for success: Award winning, Conjure-designed HMI application, Irdeto Cloakware™ Software Protection for mobile app, ECU-side functionality and cloud services, as well as a complete back-end management system.

Flexible connectivity, strong cryptography, secure storage and advanced software protection combine to ensure that vehicle 'keys,' with their associated policies, are always functional and protected, even when no phone coverage or internet access is available.

The attack surface on a complex multi-platform, multi-connected system such as an internet-connected vehicle entry system is very broad with pitfalls due to lurking zero-day bugs throughout. Keystone has been carefully designed with a full threat/risk analysis done from the start. Keystone security isn't an afterthought, but rather a carefully considered solution that doesn't impede usability or flexibility in operation.

### KEY BENEFITS

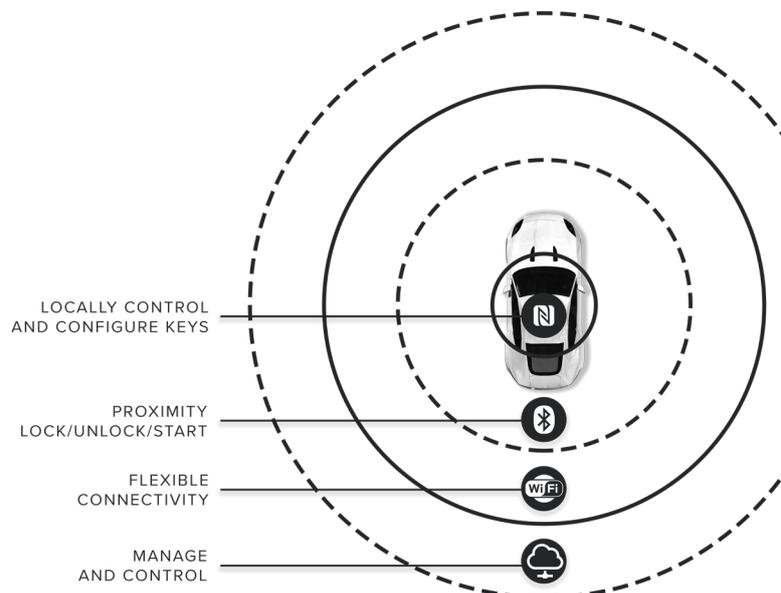
#### Creative Use Cases

Keystone's flexible policy system and in-depth security enables a variety of business cases:

- Private vehicle ownership and key sharing with enhanced safety policies
- Car-sharing
- Car rental and fleet management
- In-vehicle delivery
- Vehicle-as-a-service (VaaS)

#### Attacks Mitigated

- Man In The Middle Attacks (MITM): by relying on Cloakware™ strong encryption technology
- Man At The End Attacks (MATE): by protecting the app at runtime and at rest against tampering
- In-Vehicle Attacks are prevented by applying code cloaking and hardening techniques to the application running on an ECU
- Amplified Relay Attacks are prevented by Keystone's communication protocols and risk assessment engine
- Replay Attacks are avoided by using cryptographic techniques such as nonces and signatures



## KEY TECHNOLOGIES

Keystone's mantra is: "Secure. Flexible. Simple." Each feature of the Keystone solution is crafted with these concepts in mind.

### Security

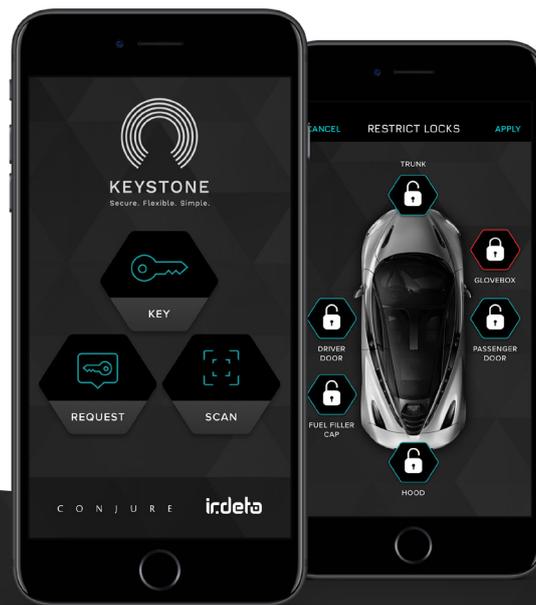
- Cloakware™ Whitebox cryptography and the Cloakware Secure Apps framework to provide security in depth
- Mobile application is protected at runtime against tampering and reverse engineering by means of integrity verification, jailbreaking / rooting detection, anti-debug and hooking frameworks detection
- Key and application data are protected at rest using a node-locked secure storage
- Communication channels between the app and vehicle, as well as between the app and a cloud service, are protected using white-box cryptography
- Keystone enables secure transfer of a virtual vehicle key from the main app to a secondary user
- Security events can be reported to the vehicle and / or Keystone cloud service to enable proactive threat detection and key monitoring

### Flexibility

- Policies can be created, transferred and revoked at any time by users, operators or OEMs
- Keystone doesn't require internet access or mobile phone coverage. It can operate even in underground parking garages or remote locations
- Leverages Bluetooth® Low Energy (BLE) technology to provide an accurate real-time picture of the key position in space relative to the car
- NFC smartcards can be used in complement to the Keystone app when a second factor is required or when the phone's battery is depleted
- Keystone supports iOS, Android and smartwatches
- OEM can choose between cloudless, on premises or a managed service deployment

### Simplicity

- Intuitive and elegant app and IVI design by award-winning HMI expertise of Conjure
- Sharing a key is as simple as scanning a QR code
- Keystone APIs can readily integrate with any back-end infrastructure for simple deployment



C O N J U R E

cloakware™  
by irdeto

Conjure is a digital experience company with a strong track record developing daring, original applications for emerging technology platforms, harnessing the opportunities they present to our global client base of major brands and disruptive startups. We don't just create apps, we also develop and maintain back-end and content management systems, as well as analytics tools that measure business return. Through multiple programs for the automotive and motorcycle industry, we have developed a class-leading HMI design and development process.

Irdeto is the world leader in digital platform security, protecting platforms and applications for media & entertainment, automotive and IoT connected industries. Our solutions and services enable customers to protect their revenue, create new offerings and fight cybercrime. With nearly 50 years of expertise in security, Irdeto's software security technology and cyber services protect over 5 billion devices and applications for some of the world's best known brands. Our unique heritage as a subsidiary of multinational media group Naspers (JSE: NPN) means that we are a well-established and reliable partner to help build a more secure future.