



# Basics of Remote Keyless Entry

# Remote Keyless Entry (1)

## Uni-directional

### First systems: **Fixed code**



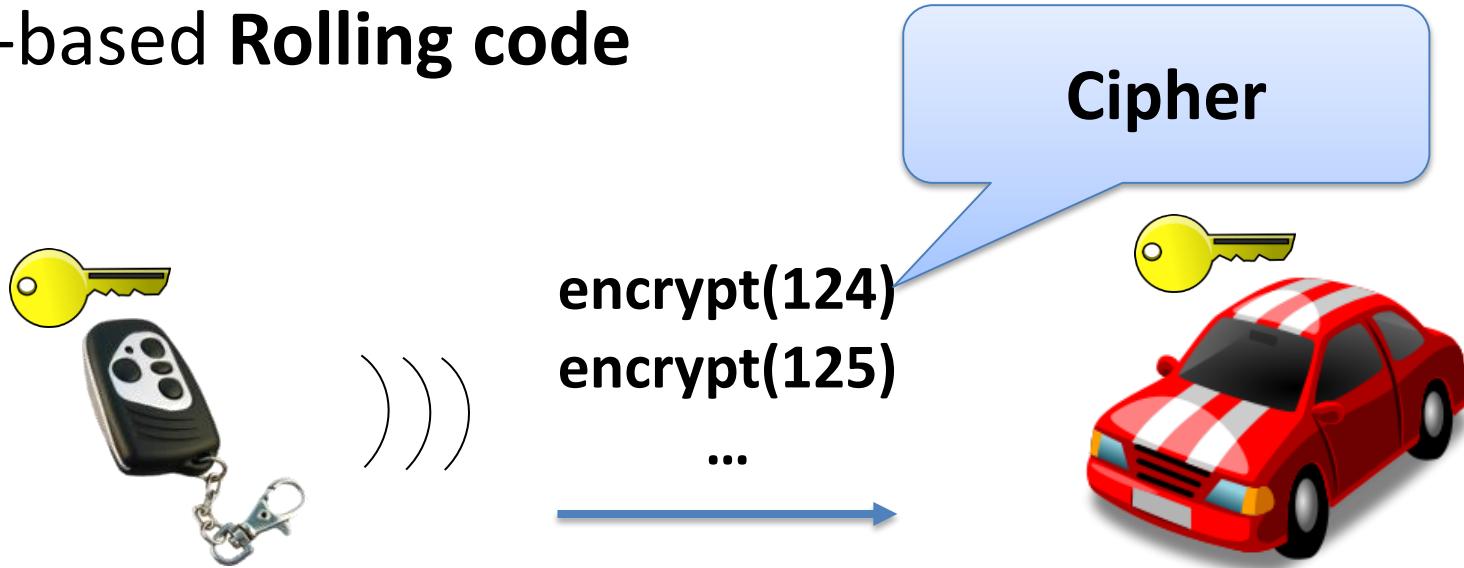
123xbhdsgf ...  
123xbhdsgf ...  
123xbhdsgf ...



# Remote Keyless Entry (2)

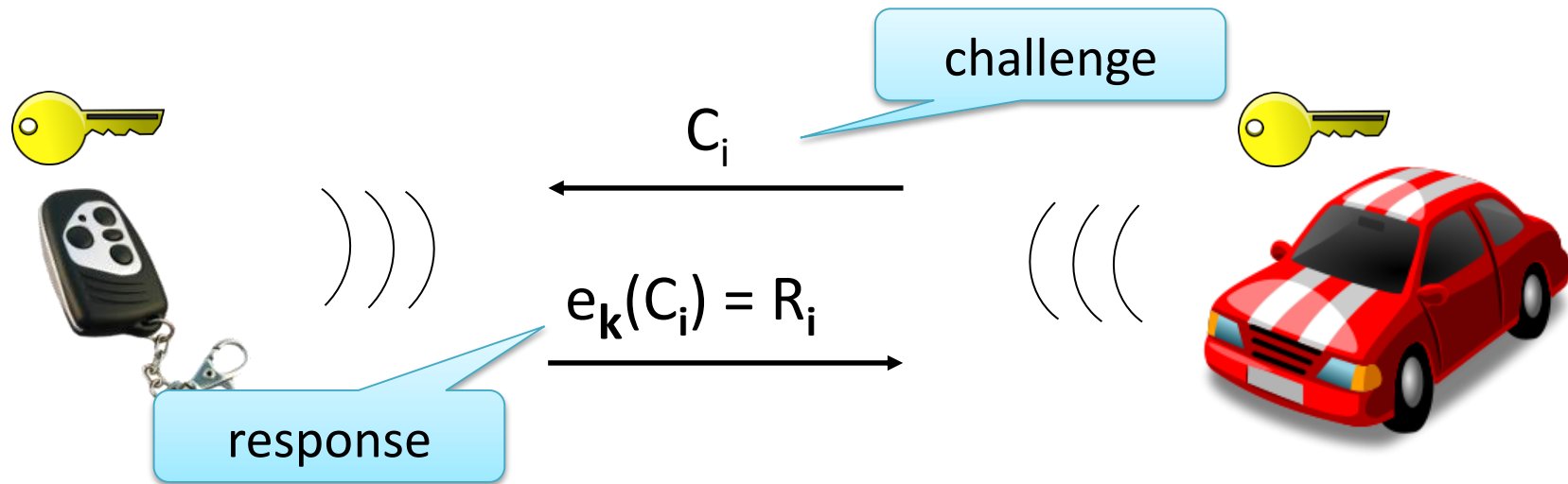
## Uni-directional *with Crypto*

### Counter-based **Rolling code**



# Remote Keyless Entry (3)

## Bi-Directional: Challenge-Response



1. computes:  $R'_i = e_k(C_i)$

2. verifies:  $R'_i \stackrel{?}{=} R_i$