ST64UWB family

Next-gen UWB ICs
for premium hand-free access
and smart sensing

What’s new?
Upcoming 802.15.4ab UWB standard

Next-gen UWB (IEEE 802.15.4ab) benefits

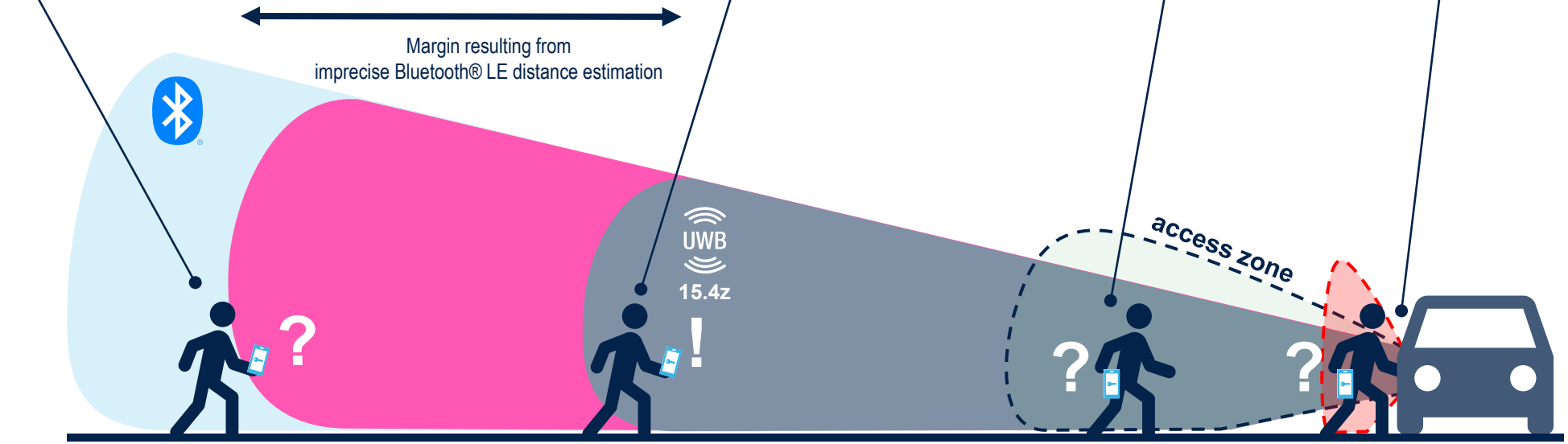
802.15.4z current standard
Top 4 challenges for car access

Key fob/phone can be detected but **cannot be ranged** from a long distance.

Key fob/phone detection at a medium range when carried out of pocket.

When the Key fob/phone is in the back pocket, it **cannot be detected** even at a short distance.

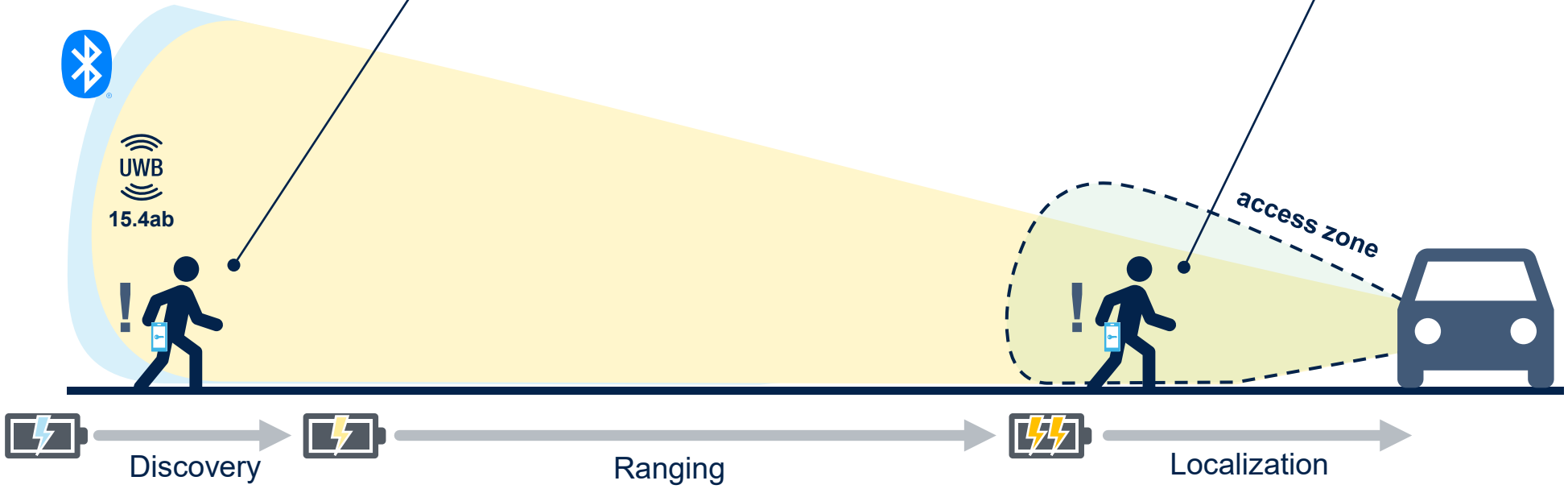
If too few car anchors can range to the key fob/ phone, the door may **fail to unlock promptly** or may not open at all.



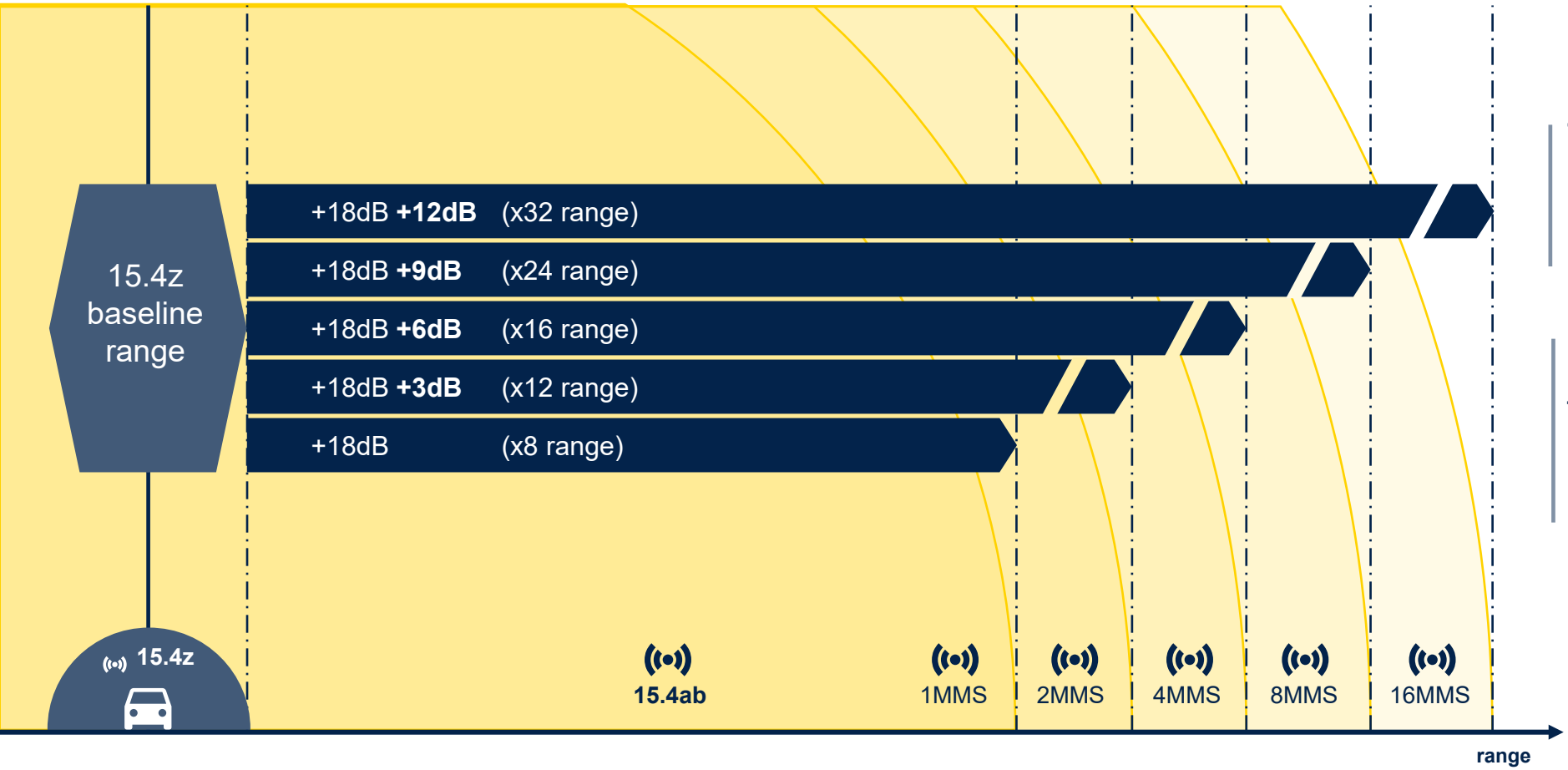
Upcoming 802.15.4ab standard unlocks premium car access

Key fob/phone can be detected & tracked
from a greater distance
even when kept in the **back pocket**.

Seamless user experience
Reliable unlock, even in back-pocket use
because the keyfob/phone
is located by all anchors.



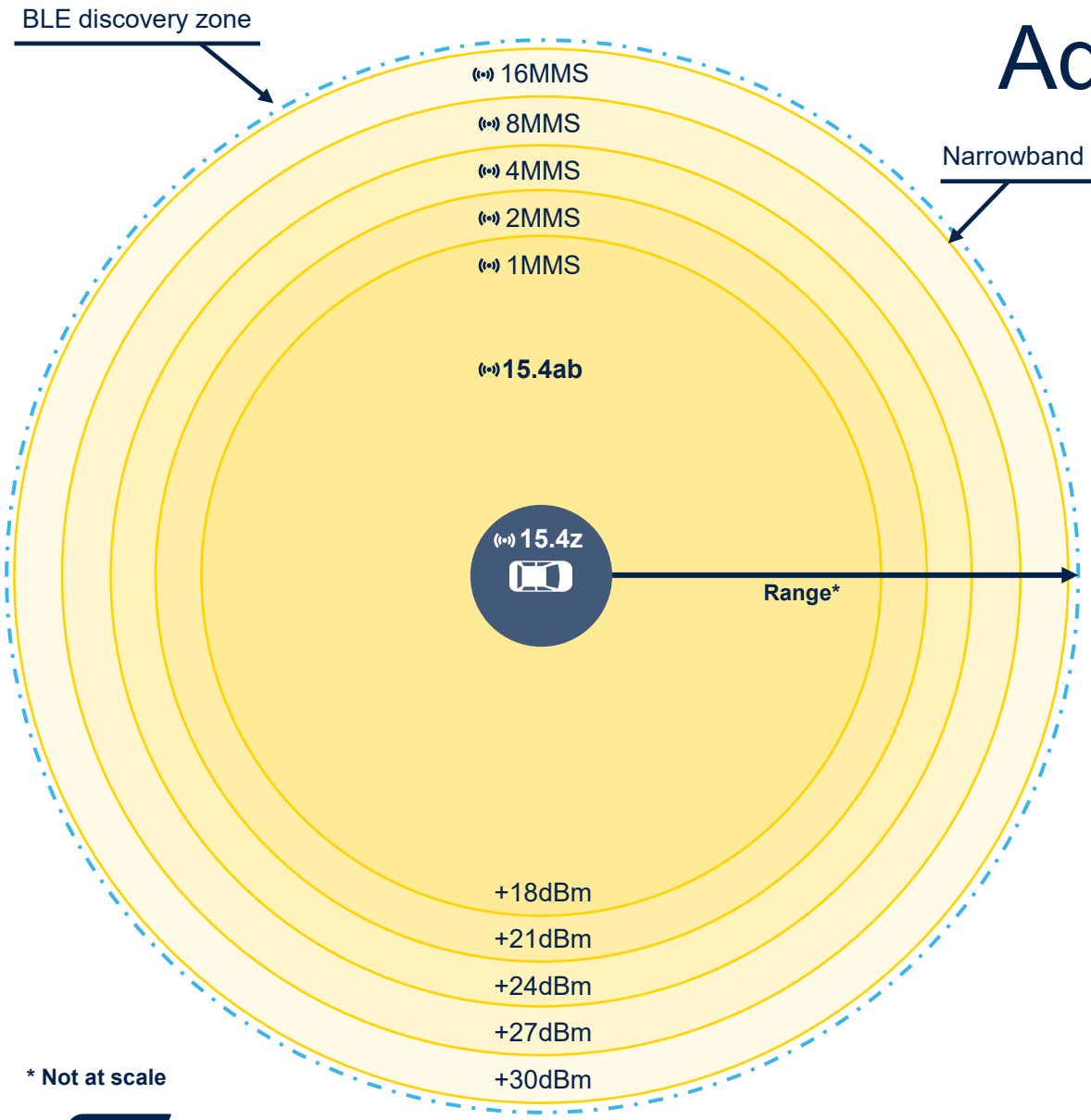
Upcoming 802.15.4ab standard
Multi-millisecond (MMS)



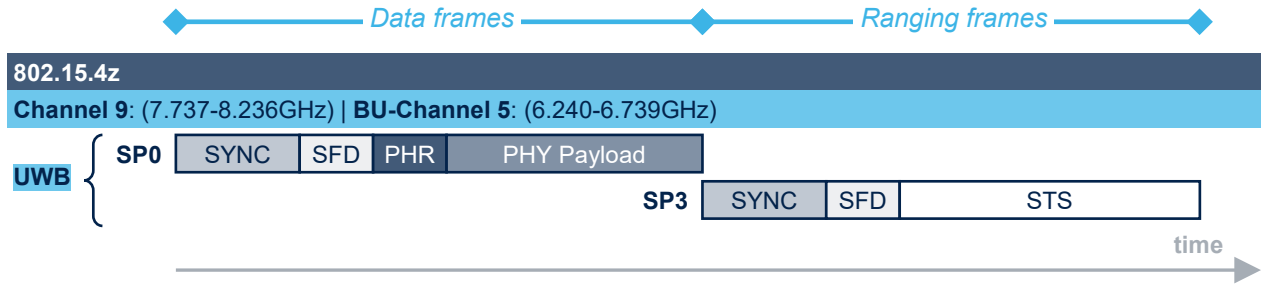
The **15.4ab 1MMS** brings a **major range improvement (x8)** over the 15.4z standard.

Each doubling of the MMS frames **increases the link budget** by 3 dB, every 6 dB increase range is doubled.

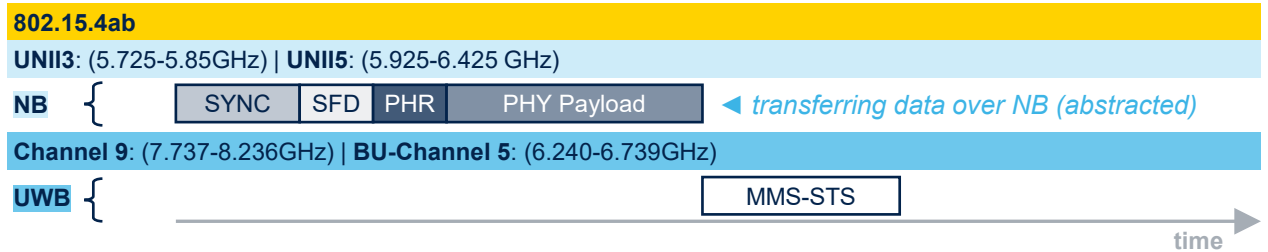
Superior UX
Advanced ranging for CCC DKS



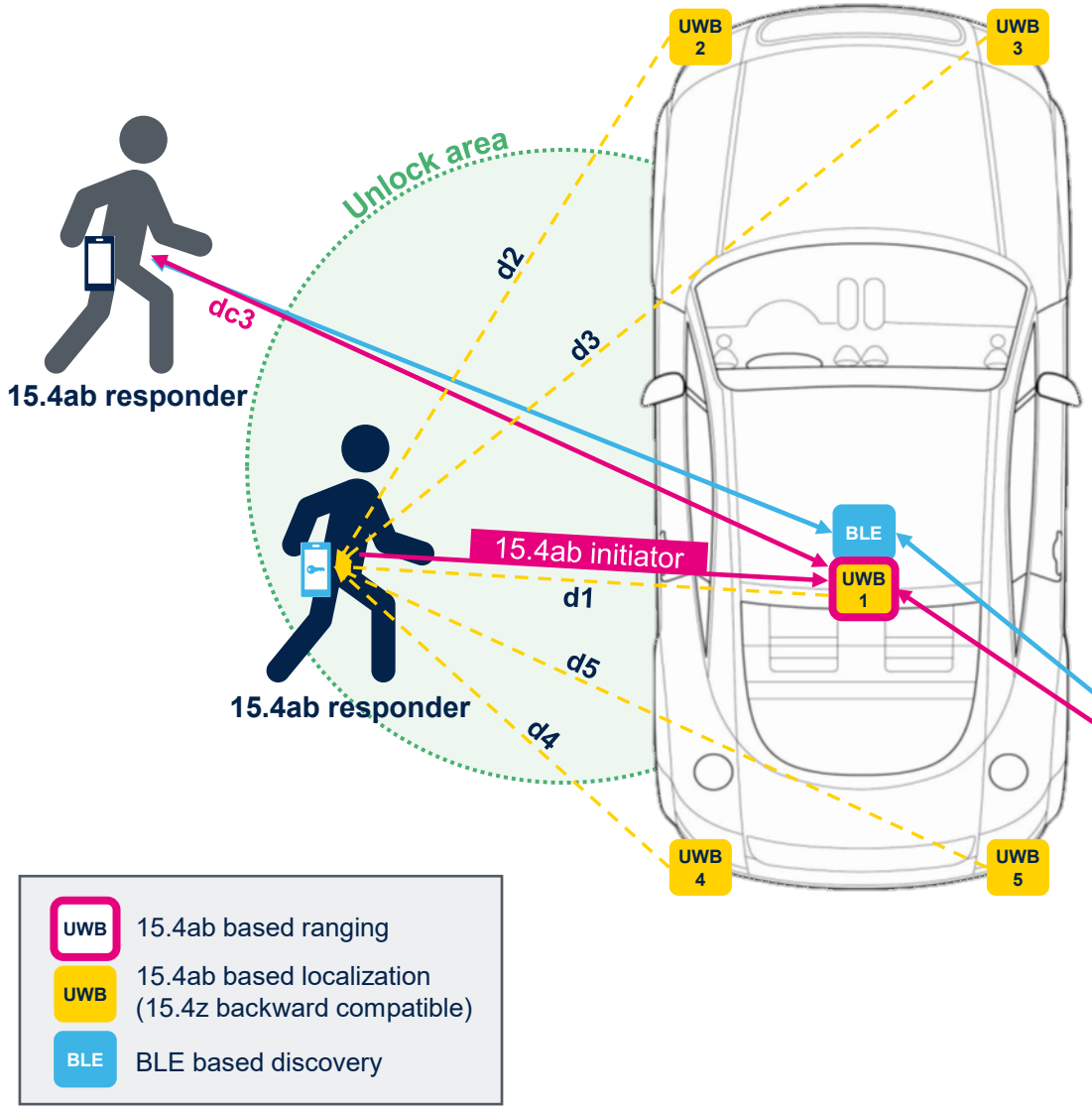
* Not at scale



➔ Moving SP0 data frame to NB



Superior UX
Staying focus on the right user



Car contains several 15.4ab responders + BLE advertiser

- The car acts as a 15.4ab UWB initiator communicating with several responders (mobile devices).
- The car measures the precise distance to multiple mobile devices.
- The car can estimate the intent of approach.
- If a device is close enough, the car starts a localization procedure with several 15.4ab UWB responders.
  - The mobile phone acts as a 15.4ab initiator.
- When several mobile phones are present, the car can preselect which one to localize.
- Each car anchor also supports 15.4z, ensuring backward compatibility and allowing simultaneous 15.4ab and 15.4z sessions.

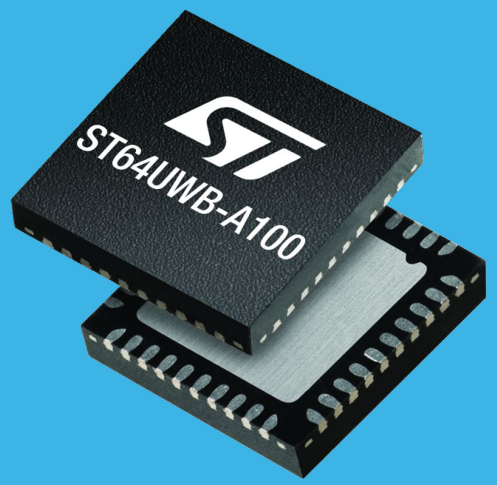
Upcoming 802.15.4ab standard
Explore all the benefits

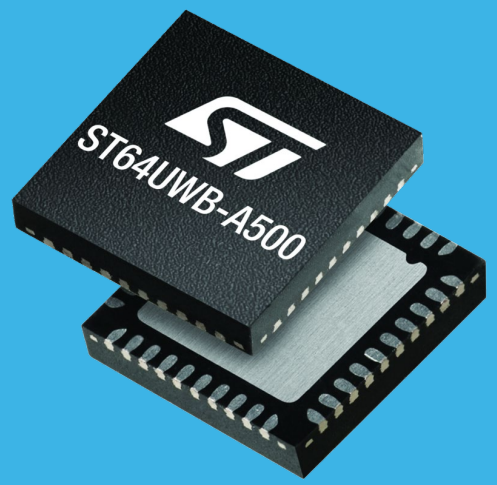
What's new in UWB?	
Current standard (15.4z)	Next-gen UWB (15.4ab)
Standard baseline	**> 18 dB boost** Hundreds of meters
Line-of-Sight only	**Enhanced robustness** Works in back pocket
High consumption	**Just in time ranging** Lower consumption
Proprietary Radar	**Standardized Radar** Native sensing option

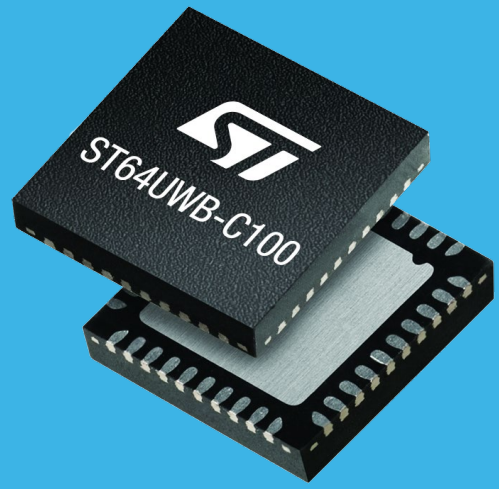
Read the whitepaper from ABI Reseach

DOWNLOAD NOW

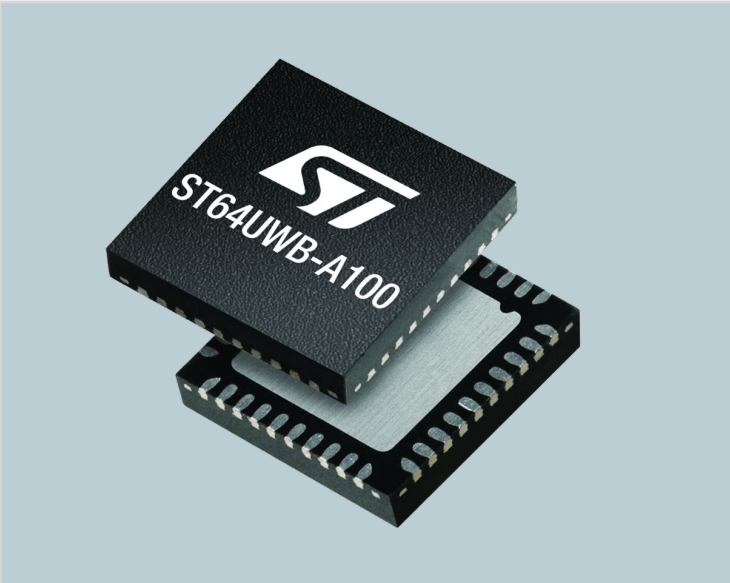
ST64UWB product presentation





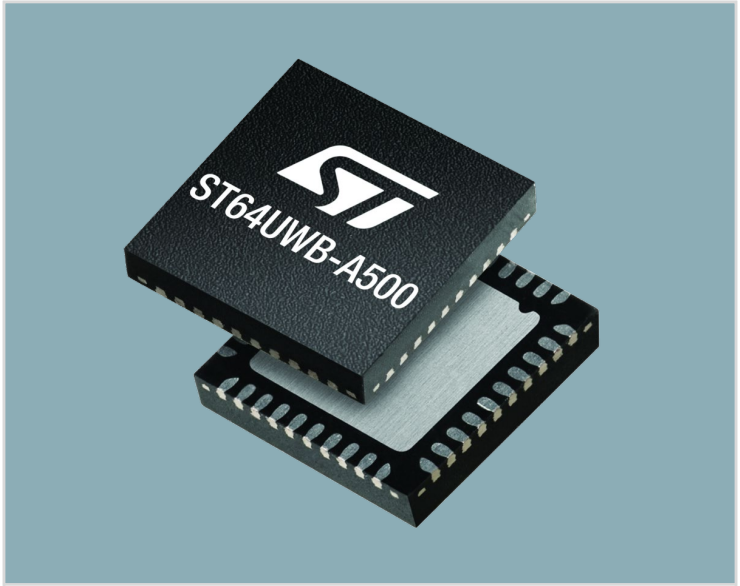


Meet the ST64UWB product family



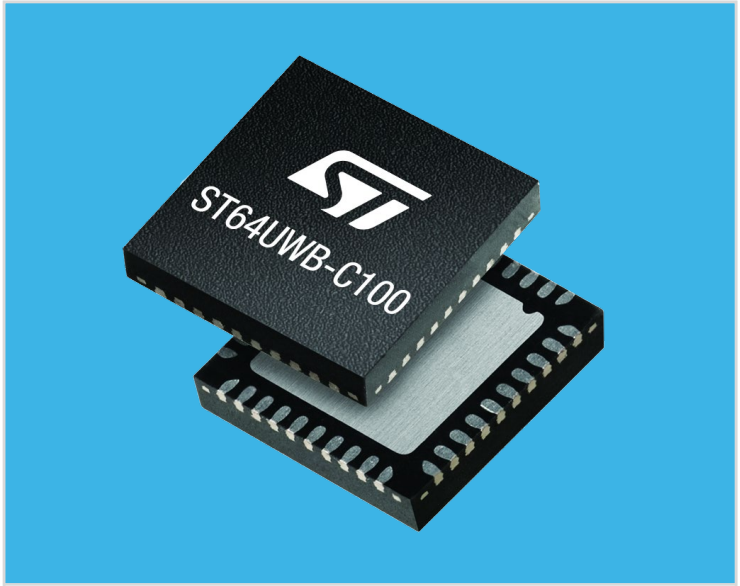
Optimized UWB+NB distance ranging for automotive

Two-in-one solution delivering a seamless access experience, even in NLOS conditions, for ccc digital keys.



UWB+NB ranging and radar sensing for automotive

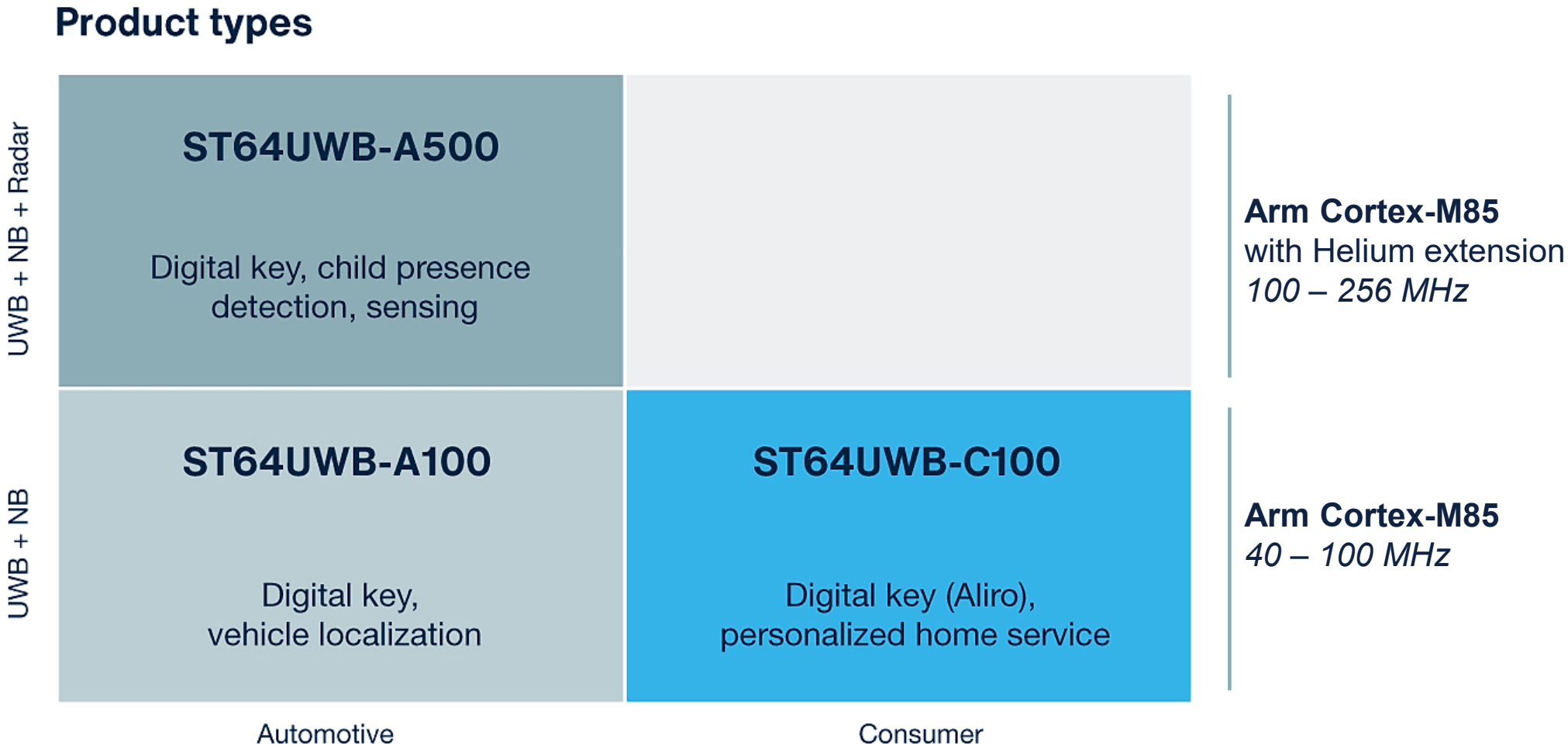
Three-in-one automotive solution fusing in-cabin protection, radar sensing, with seamless access control.



UWB+NB distance ranging covering smart homes

Delivers reliable distance ranging with low-consumption and simplified integration, optimized for access control (CSA, Aliro).

How to select the right product?

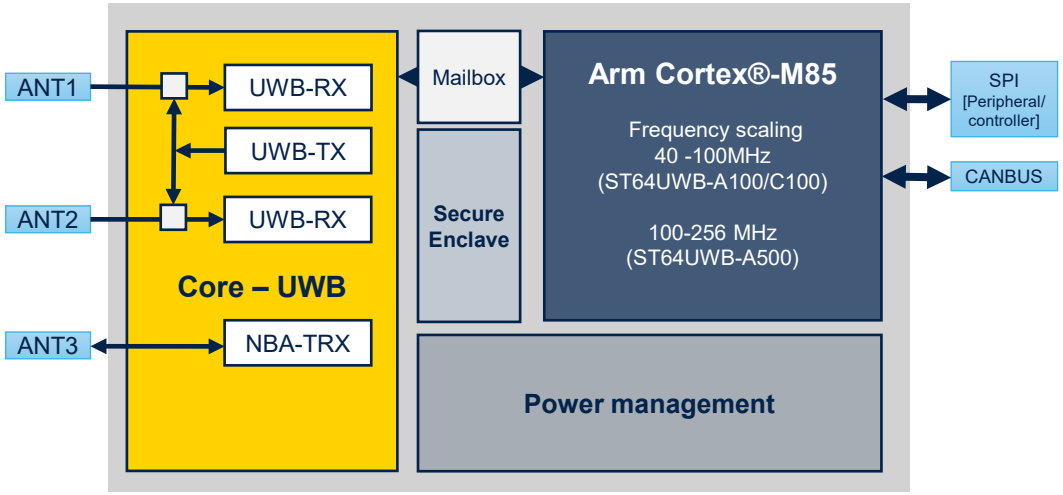


ST64UWB product family (detailed)

	ST64UWB-A100	ST64UWB-A500	ST64UWB-C100
Primary market	Automotive entry	Automotive premium	Industrial/Smart home
Key features	UWB + NB ranging	UWB + NB ranging + radar	UWB + NB ranging
Extended range	650m+	650m+	650m+
Radar range resolution	—	<7.5cm (CPD-capable)	—
Arm® Cortex®-M85 core	40 – 100 MHz	100 – 256 MHz + Helium®	40 – 100 MHz
AI acceleration	—	✓	—
Multi-channel support	5, 6, 8, 9, 10, 12	5, 6, 8, 9, 10, 11, 12	5, 6, 8, 9, 10, 12
AEC-Q100-Grade 2	✓	✓	—
Security	SESIP L3	SESIP L3	SESIP L3
Package	WFQFN40 (6 x 6 mm)	WFQFN40 (6 x 6 mm)	WFQFN40 (6 x 6 mm)
Best for	Digital key, vehicle localization	Digital key + CPD + object sensing	Aliro locks, smart homes, IoT

ST64UWB overview

Block diagram



Unique value proposition

- **+50% range** in 802.15.4z mode
  (3 dB better sensitivity based on FD-SOI)
- Up to **8x the range with** 802.15.4ab in NBA+MMS mode
  (+18 dB link budget with 1MMS)
- **Compliant** to IEEE 802.15.4ab
- **Best-in-class radar**: 2x resolution with high bandwidth
  - **Single chip radar**
  - **4x faster** processing with Arm® Cortex®-M85
- **CAN-FD** MAC integration
- **Future proof** with UWB channels: 5,6,8-12 (6.5-9 GHz)
- AEC-Q100-Grade 2
- 6 x 6 mm HWQFN40L (0.5 mm pitch)

Create smarter products with ST64UWB

Overcome back pocket issue

- **+50% range** in 802.15.4z “legacy” mode
  - 3dB better sensitivity based on FD-SOI
  - Compliant with FiRa, CCC, and current phone UWB implementations
- **Up to 8x the range** in new **802.15.4ab mode**
  - 15.4ab in “real” NBA+MMS mode
    - adds up to 18dB link budget vs. 4z mode
  - Up to 16 MMS frames
    - up to additional 30 dBm link budget vs. 15.4z
  - Compliant to 802.15.4ab

Improve customer experience

Reduced system costs

- **Potential reduction of system components**
  - 15.4ab allows redundancy and improved customer experience compared to 15.4z systems
  - Potential reduction # anchors possible
- **Single chip RADAR**
  - Cortex M85 on chip RADAR processing supported by HELIUM extension for AI acceleration & VECTOR machine
- **CAN-FD MAC integration**

Improve engineering experience

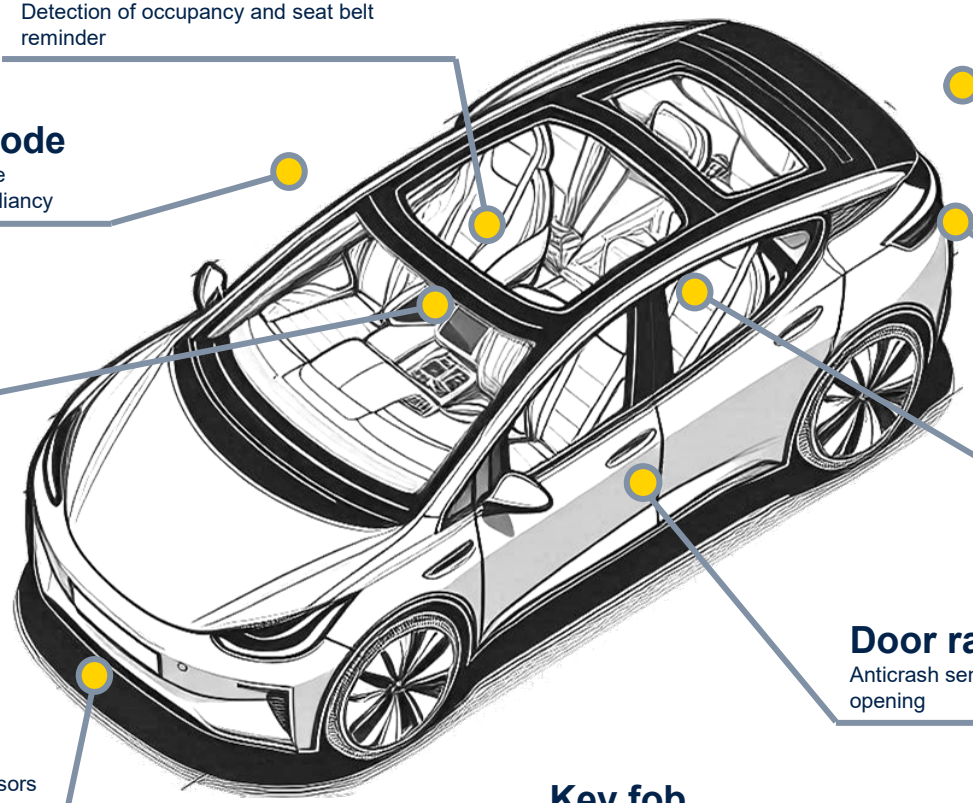
Boost RADAR performance

- **High bandwidth**
  - Doubles absolute distance measurement accuracy
  - Close-by objects can still be separated
- **15.4ab “addons” for RADAR**
  - Kaiser window pulse shape with near zero side lobes allows for more accurate sensing.
- **High speed ADC**
  - Doubles precision of relative distance measurement to current implementations

Allows for new RADAR capabilities

New and enhanced use cases

UWB OEM use cases



Seat occupancy / belt
Detection of occupancy and seat belt reminder

Trailer support
Calculation of turning angle for reversing with trailers (anchor in trailer)

Vehicle sentinel mode
Pre-trigger for camera surveillance
For power reduction & legal compliancy

Kick sensor
Replacement of the capacitive kick.
placed in trunk & frunk

Dash cam
Activation for Dash cam
for legal compliancy

CPD
Replacement of 60 GHz for child presence detection & sensor fusion for future NCAP

V2X
Location of parking, charging spot.
Personalized parking (User not car)

Door radar
Anticrash sensor for (automatic) door opening

Parking sensor
Replacement of the ultrasonic park sensors

Key fob
Replacement of the HF/LF key fobs

V2C
Location of car; localization of passenger welcome & remote services; summoning

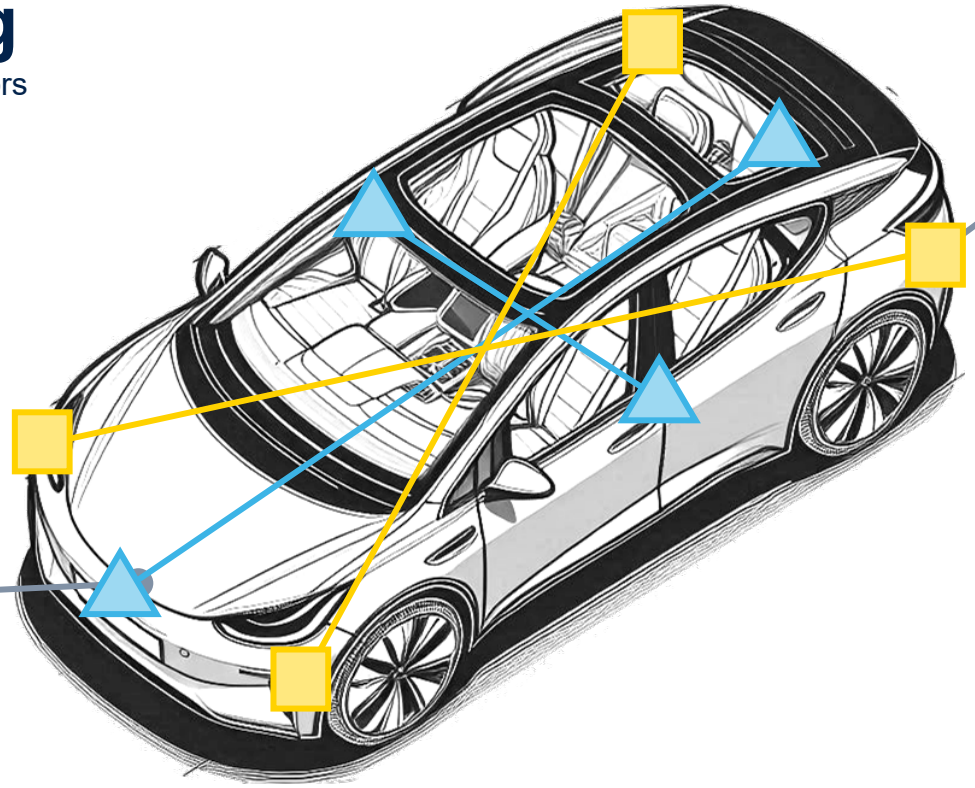
UWB OEM anchor placement

Anchor positioning

Two main positioning options for ranging anchors

X configuration

Usual corner placement;
Improved park & kick sensor



+ configuration

Front, rear, left, right position
Reuse for door radar, kick sensor

Upcoming 802.15.4ab standard
New use cases enabled

Find my car
The driver can find the car easily on a large parking area even if GPS isn't available.

Smart summoning
The driver can remotely call the car to their position. The car can pinpoint the exact position of the driver on a parking lot.

Find my customer
The autonomous taxi locates passengers precisely, even without GPS, eliminating fixed pick-up points and unsafe street crossings.

Find free charging/parking spot
The car can pinpoint the exact position of an available parking/charging spot, reducing waiting time.

Welcome & remote service
The car detects the driver and activates functions like beamformed light depending on distance.

HF/LF key fob replacement
The key fob is reliably detected at sufficient distance for a seamless user experience, while OEMs cut costs by removing legacy systems.

Our technology starts with You

Find out more at st.com/UWB