



ST solutions for Aliro secure access control





New standardized communication protocol

for secure, interoperable, and convenient access control

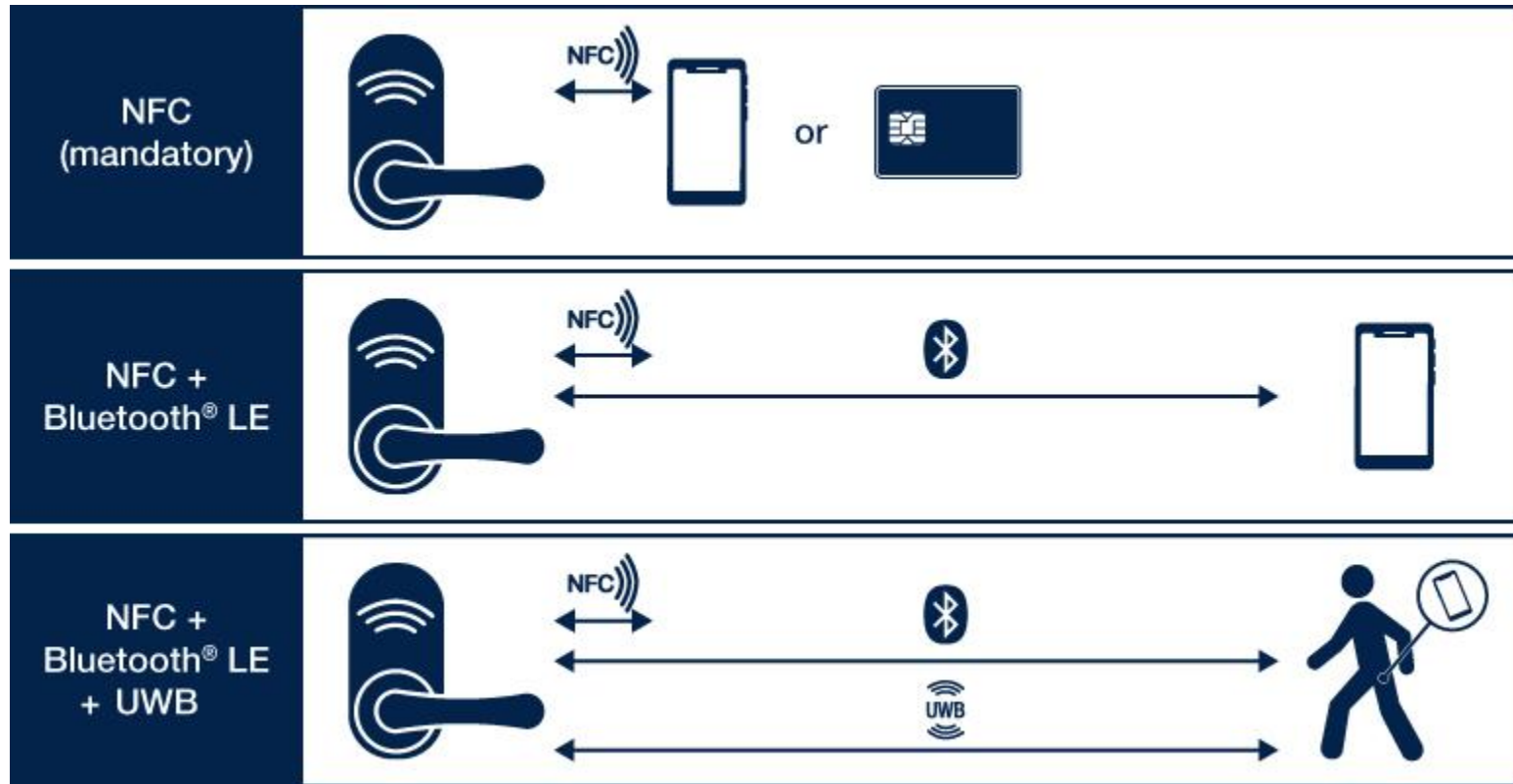
Industrial

Hospitality

Commercial

Residential

Airo standard connectivity architectures



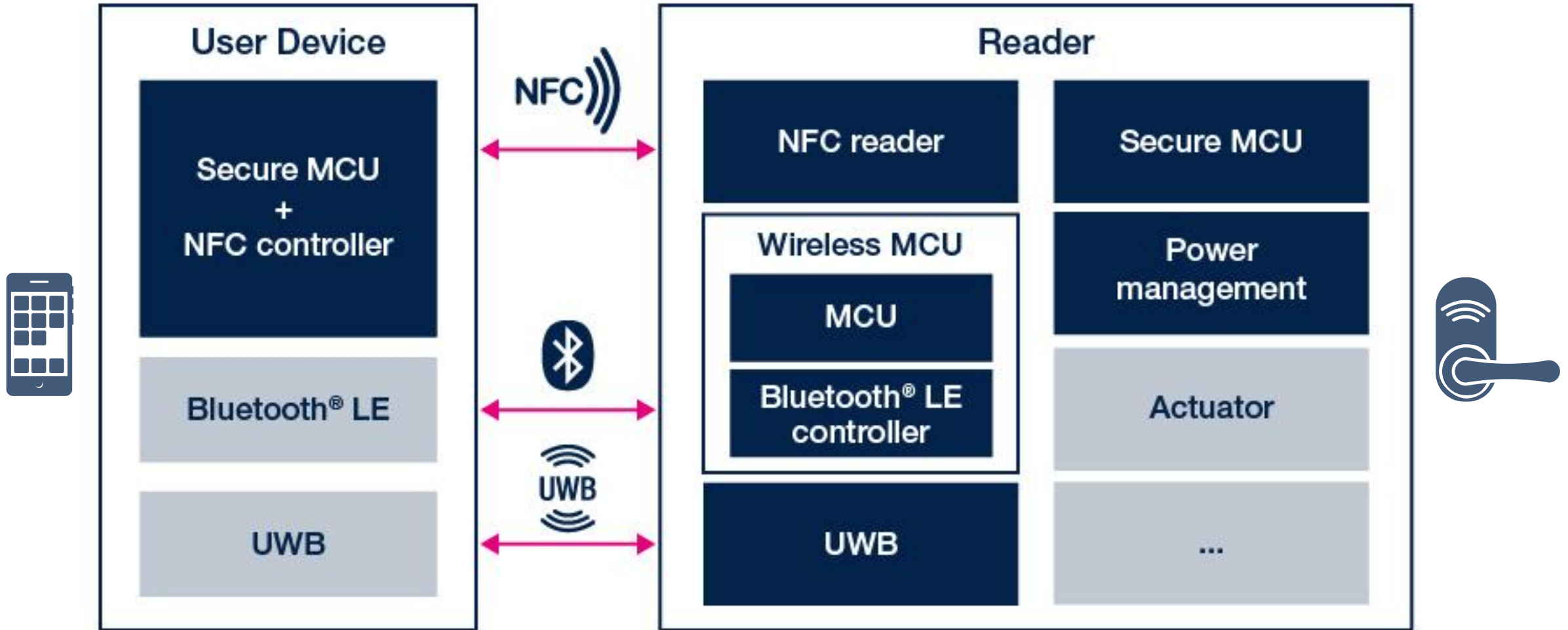
A reliable solution for contactless tap-and-go access with a smartcard or smartphone.

A flexible solution with two connectivity technologies that offers users multiple options for tap-and-go access.

A complete solution for secure, hands-free access control without the need to tap the user device.

ST supports all three configurations

Architecture diagram



■ ST Aliro-ready products available



ST portfolio supporting Airop

Solution architecture	MCU	Wireless MCU	NFC reader	UWB	Secure MCU
NFC	STM32U5	-			
NFC + Bluetooth® LE		STM32WBA5 STM32WBA6	ST25R200 ST25R210 ST25R300	-	STSAFE-A110 STSAFE-A120
NFC + Bluetooth® LE + UWB				ST64UWB-C100	



Benefits of working with ST on Aliro designs

5 reasons why ST helps device makers accelerate time-to-market



Complete portfolio

ST products suitable for all Aliro device architectures



Low power consumption

Extend the lifetime of battery-operated designs



Security certifications

Certified products with asymmetric cryptography



Longevity commitment

Quality assurance program to ensure product longevity



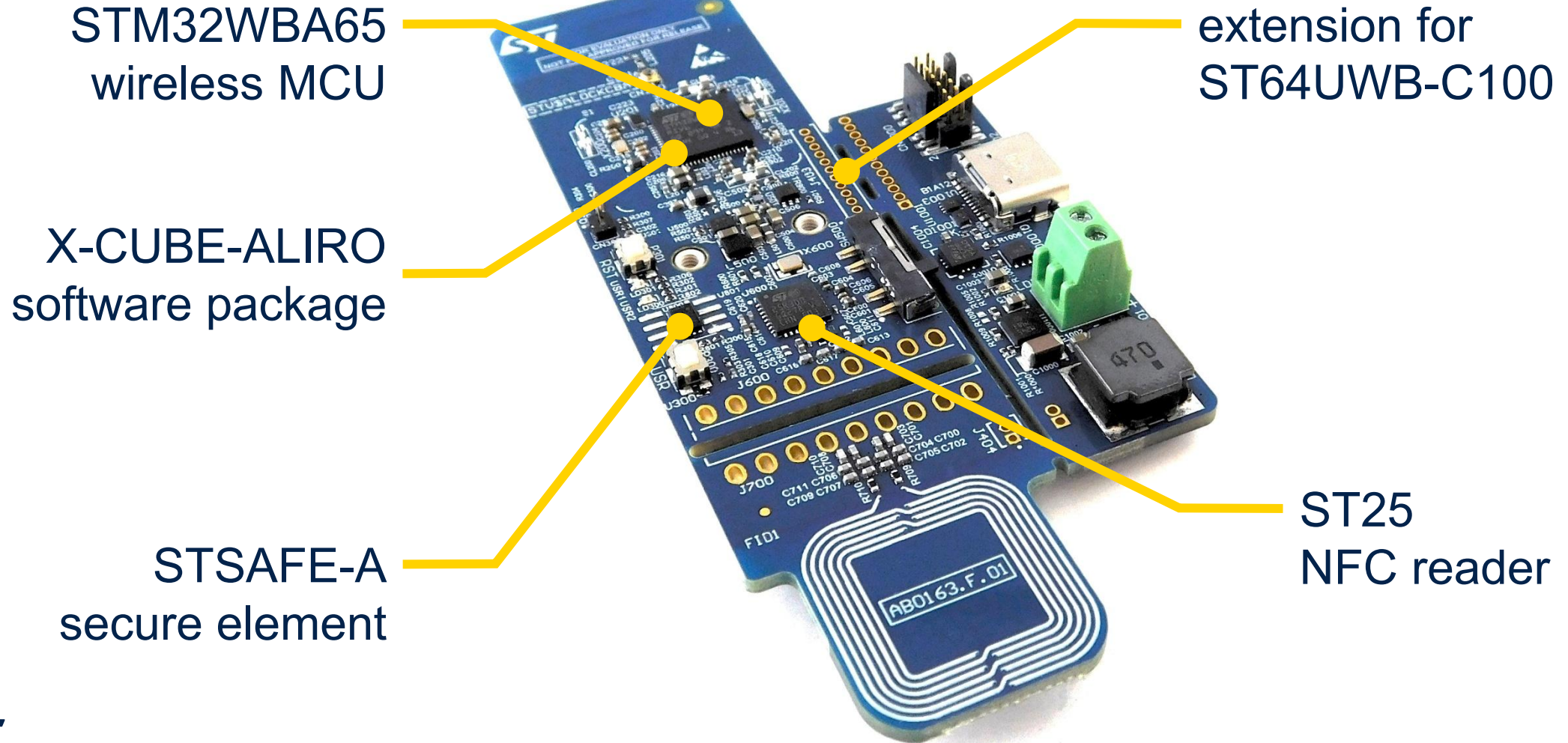
Complete ecosystem

Resources for faster platform development and certification

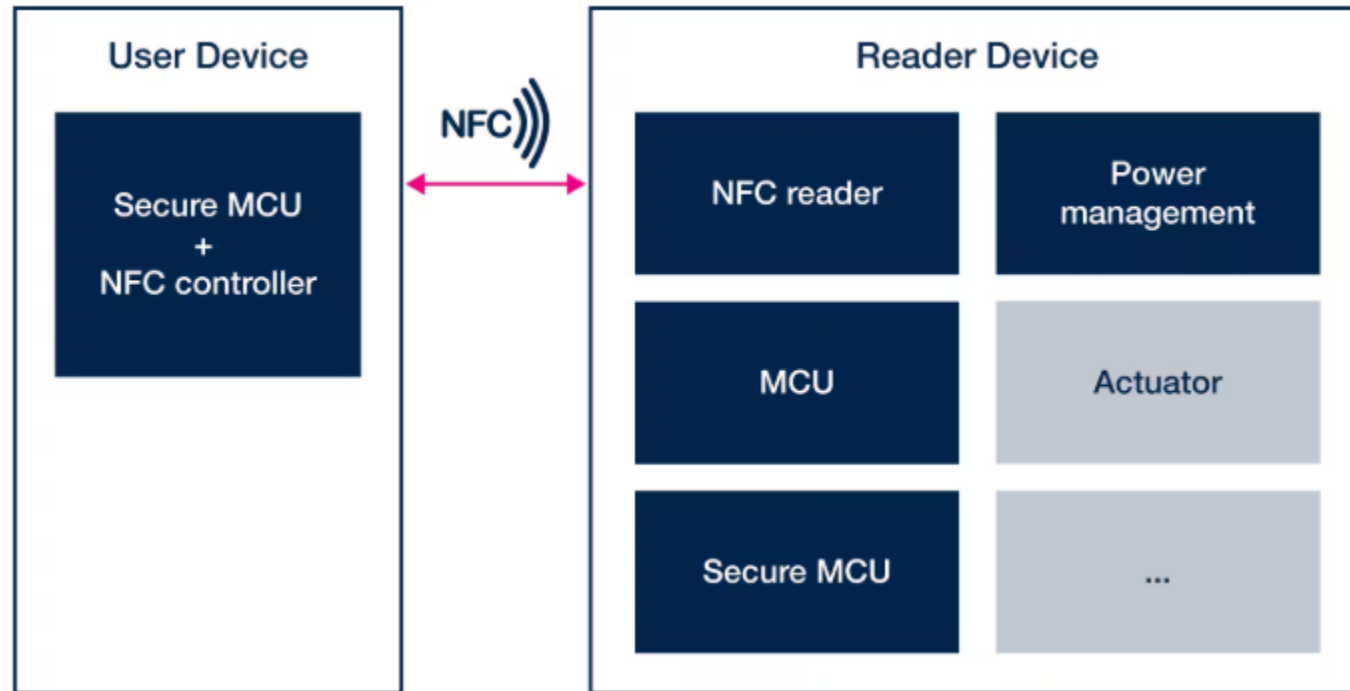


STEVAL-ALOCKCB reference design

Full ST solution for Aliro



NFC-only configuration





STM32U5

Advanced power-saving MCUs



Meeting the most demanding power/performance requirements

- Based on the Arm Cortex –M33 at 160 MHz
- Digital signal processing (DSP)
- Floating-point unit (FPU)
- Innovative power management features
- LPBAM*, DMA, and IP autonomous in LP mode

High integration

- Up to 512 Kbytes of flash memory and up to 274 Kbytes of RAM
- Wide range of package options
- USB full speed

Higher security and safety

- AES and PKA, side attack resistant
- ECC on flash memory and SRAM

Key benefits

- Extending battery life
- Enhanced energy efficiency
- Cost-effective design
- Protecting data

*Low power background autonomous mode



Readers



STM32
microcontroller



ST25R

13,56 MHz



NFC phone

ST25R210



Optimized NFC reader for Aliro access control platforms



Key benefits

- Most sensitive reader for access control applications
- Advanced features (LPCD, DPO, AAT, AWS, NSR...)
- Smallest package for an NFC reader on the market (4 x 4 mm, 28-pin QFN)
- France as country of origin

Key features

- Superior low power card detection based on inductive wake-up
- Extended range and outstanding robustness for enabling fast NFC Forum & CSA Aliro platform certification
- France as country of origin (COO)
- Advanced antenna tuning for max performance over a wide range of loads
- Supports NFC-A/B up to 848 kbps, NFC-F to 424kbps and NFC-V to 212kbps as well as low-level modes to implement MIFARE classic compliant or other custom protocols



Hardware characteristics

- Supports NFC reader/writer and card emulation mode
- Operating voltage from 2.7 V to 5.5 V
- Antenna driver voltage range, up to 5.5 Vp with 1.6 W output power
- Smallest QFN-28 4x4 mm package
- -40°C to +105°C extended ambient temperature range
- Serial peripheral interface (SPI) up to 10 Mbit/s



STSAFE-A120

Best-in-class embedded Secure Element (eSE)

HW CC EAL5+
certified



Key applications

- Consumables and accessories anticloning
- Smart home (Matter ready)
- Access control (Aliro ready)
- Healthcare
- Power supply (Open Compute Project)
- Metering & industrial equipment
- Wireless charging (Qi)

Rich feature set

- Authentication with personalized certificate
- Secure connection establishment
- Secure data storage
- Data hashing
- Encryption / decryption
- Signature verification

Best-in-class hardware

- Highly secure MCU, CC EAL5+ AVA_VAN5 certified
- 16 Kbytes EEPROM
- 30 years of data retention, 500k cycles
- Temperature range: -40°C to 105°C

Personalization

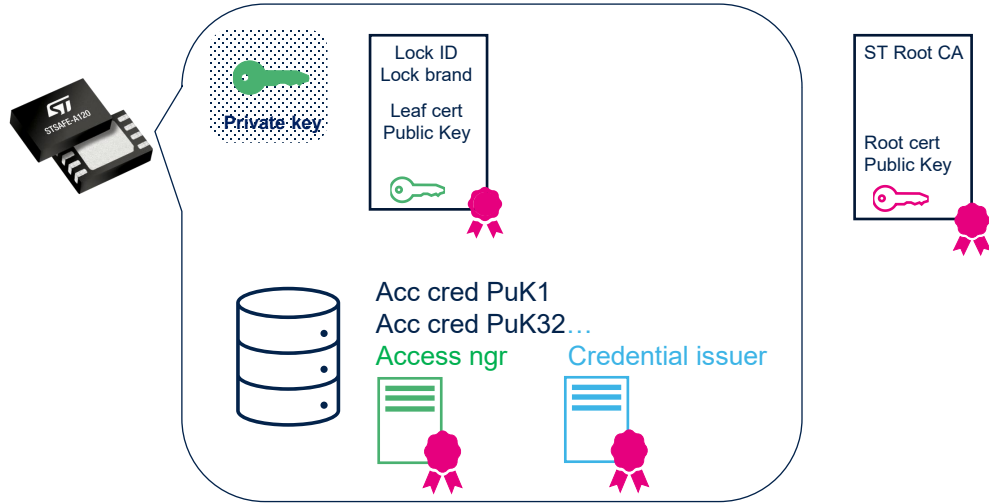
- Customer certificate and keys personalization at ST secure factory
- MOQ 5Ku



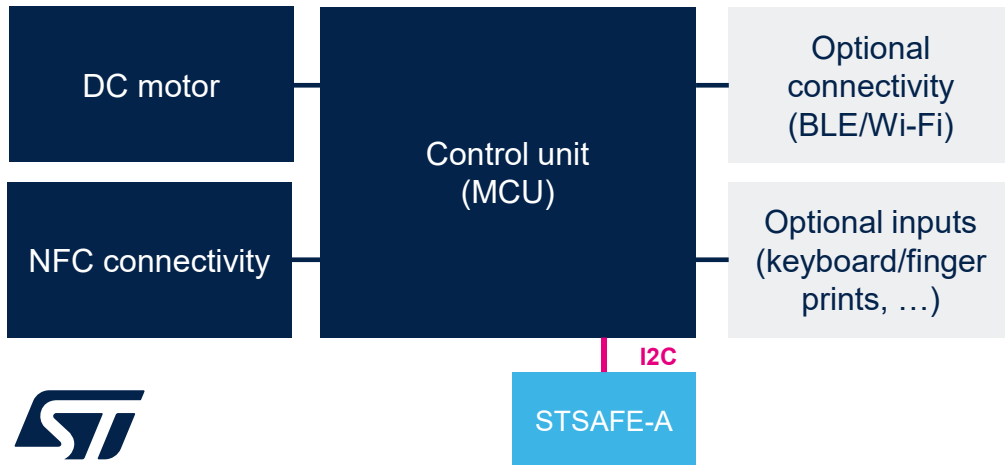


Enhance Aliro platform security with STSAFE-A120

Deliverable



Integration in lock



ALIRO basic

- Lock authentication and attestation with “Lock maker” preloaded personalized X.509 certificate(s)
- Lock usage log and report signature

ALIRO options

- Preloading and freezing of **access credentials** at ST secure factory
- Preloading and freezing of **credential issuer** X.509 certificate at ST secure factory
- Preloading and freezing of **access manager** X.509 certificate at ST secure factory

ALIRO+MATTER option

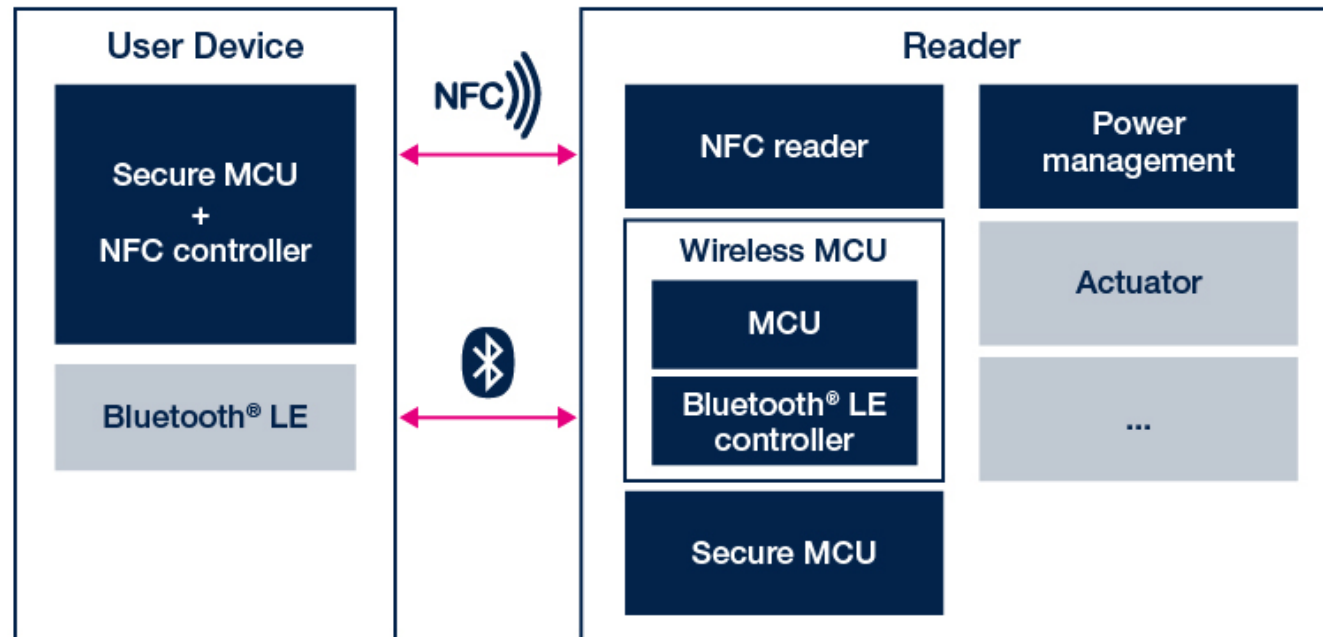
- Lock authentication and attestation with a “Lock maker” preloaded Matter compliant X.509 certificate

Best-in-class protection robustness with Common Criteria EAL5+ certified chip

Personalization at ST security certified site

- Protect keys from leakage during lock manufacturing

NFC + Bluetooth® LE configuration



■ ST Allro-ready products available



STM32WBA5/WBA6

Ultralow-power wireless MCUs



Key benefits

- Reduced BOM
- Bluetooth® Core 6.0
- High energy efficiency
- Strong security & certification ready

Enhanced wireless performance

- Based on the Arm Cortex –M33 at 100 MHz
- Based on an ultralow power platform
- Up to 2 Mbytes of flash memory and up to 512Kbytes of RAM
- Multiprotocol capabilities (Bluetooth® LE, Zigbee, Thread, Matter, and Aliro)
- High output power (+10 dBm) with low power consumption (1 dB step)

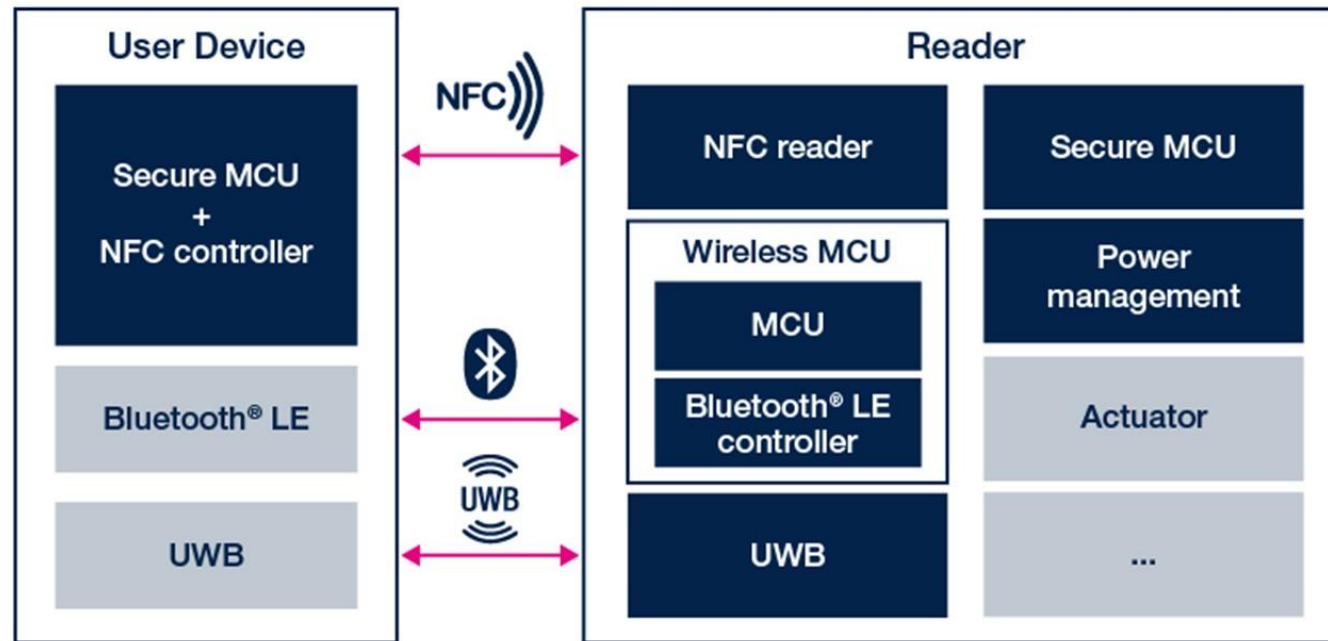
Flexibility and reliability

- Advanced connectivity with up to 86 GPIOs and USB high-speed
- Wide range of package options
- 10-year rolling longevity commitment for continuous supply
- Temperature range: -40°C to 105°C

Advanced security

- Targets SESIP level 3 and PSA level 3 certifications
- TrustZone® technology
- Compliant with the latest regulations (US Cyber Trust Mark, EU Radio Equipment Directive, and Cyber Resilience Act)

NFC + Bluetooth® LE + UWB configuration



■ ST Aliro-ready products available



ST64UWB-C100

Consumer UWB ICs for premium hand-free access and precise spatial awareness



Key features and benefits

- 50% greater range on IEEE 802.15.4z UWB technology via a unique FD-SOI process
- Designed to support future IEEE 802.15.4ab implementations
- Lowest system cost with on-chip Arm® Cortex®-M85
- Dual antennas for diversity, maximum ratio combining, and angle of arrival calculations
- Aliro software package available for fast time-to-market

Aliro hands-free and tap-free experience

The ST64UWB-C enables a complete solution for secure, hands-free access control without the need to tap the user device.

Key applications

- Aliro-compliant smart door locks and openings
- Presence-aware automation
- Asset tracking





Development tools




STM32 MCU Developer Zone


Everything for STM32 MCU developers, in one place.


 MCU portfolio


 Boards & hardware tools

 Software development tools

 Embedded software

 AI for STM32

 Wireless connectivity

 STM32Trust security framework

Jump-start your project

with an STM32 MCU

Follow these few simple steps to get started.

Complete ecosystem ready for Aliro

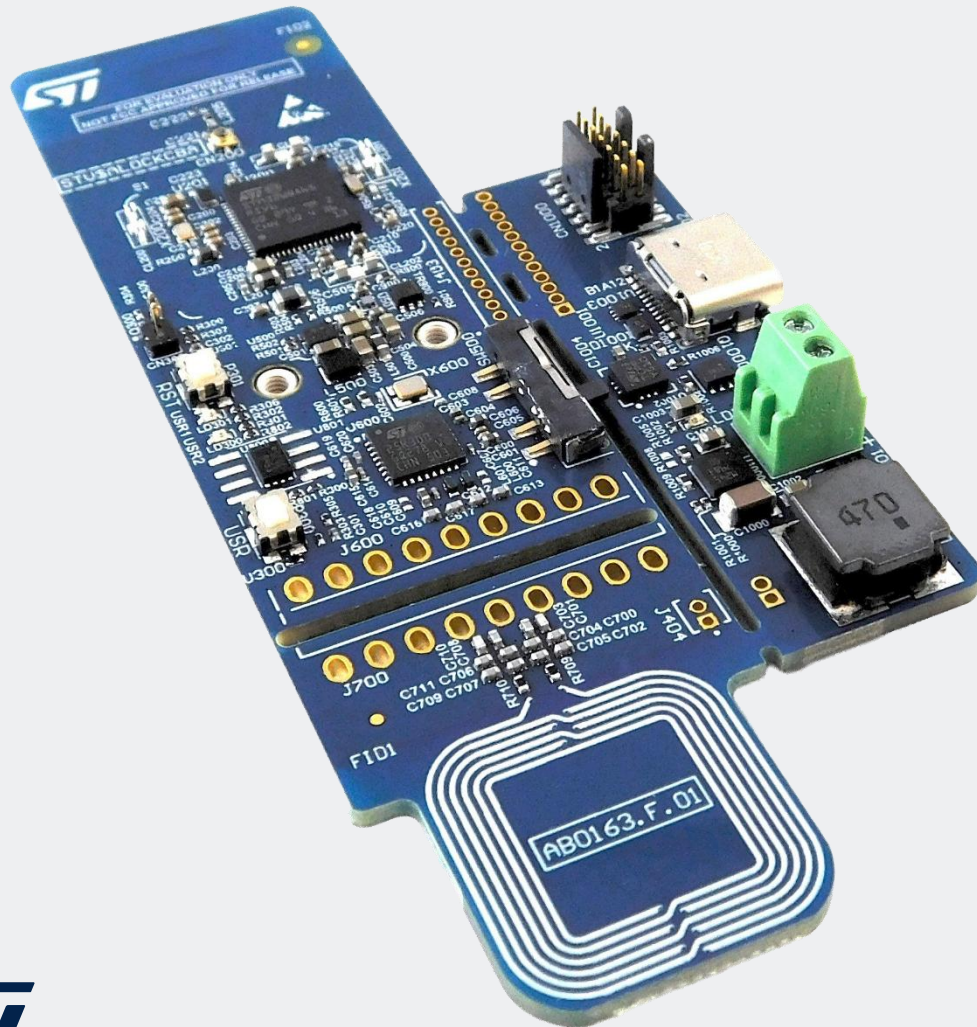


Reference design
STEVAL-ALOCKCB

Discrete hardware development tools
Nucleo & X-NUCLEO boards

Software package
X-CUBE-ALIRO

Reference design STEVAL-ALOCKCB



Address Aliro core specifications with current ST products:

- **ST25 NFC reader** and **STM32WBA wireless MCU** supported
- Built-in security with **STSAFE secure element**
- Multiple supply options (battery, USB, external power supply up to 48 V)
- 34-pin optimized expansion connector compatible with UWB, fingerprint, keypad, actuators, and MEMS sensors

Discrete hardware development tools available for Aliro

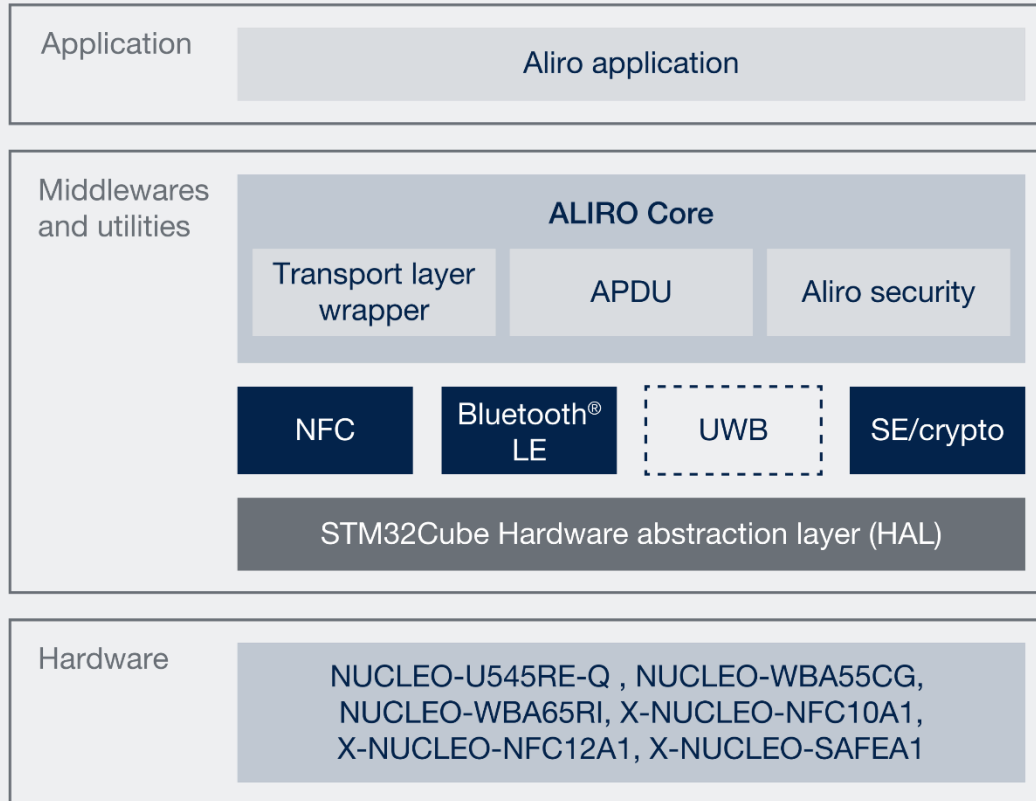
Protocols supported	NUCLEO-U545RE-Q	NUCLEO-WBA55CG	NUCLEO-WBA65RI	X-NUCLEO-NFC10 / X-NUCLEO-NFC12	X-NUCLEO-SAFE1
NFC-only	✓			✓	
NFC-only and/or NFC + Bluetooth® LE		✓	✓	✓	
NFC-only and/or NFC + Bluetooth® LE with secure key storage		✓	✓	✓	✓
NFC-only and/or NFC + Bluetooth® LE with Matter			✓	✓	

All discretets supported by X-CUBE-ALIRO



Software package

X-CUBE-ALIRO



Start developing now with X-CUBE-ALIRO:

- **Aliro protocol implementation** with ready-to-use examples for reader devices
- **NFC and Bluetooth® LE-RKE flows** supported, UWB to be integrated in a future release
- **Certified Bluetooth® LE protocol stack and NFC Forum Type A support**
- **Built-in security with secure element** supported for secure transactions and data protection
- **Comprehensive documentation, application examples, and support** to guide you at every stage of your Aliro development journey

Takeaways

Aliro is the new fully-standardized protocol for secure access control over NFC, Bluetooth® LE, or UWB.

ST products support all three Aliro reader configurations: NFC-only, NFC + Bluetooth® LE, and NFC + Bluetooth® LE + UWB.

Reference design with ST NFC, Bluetooth® LE, & secure products as well as expansion connector for UWB and multiple supply options.

Complete ecosystem with hardware development tools, software, and expert resources for easy Aliro platform prototyping & certification.

Our technology starts with You



Find out more at www.st.com/aliro

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