



ST solutions for Aliro secure access control





New standardized communication protocol

for secure, interoperable, and convenient access control

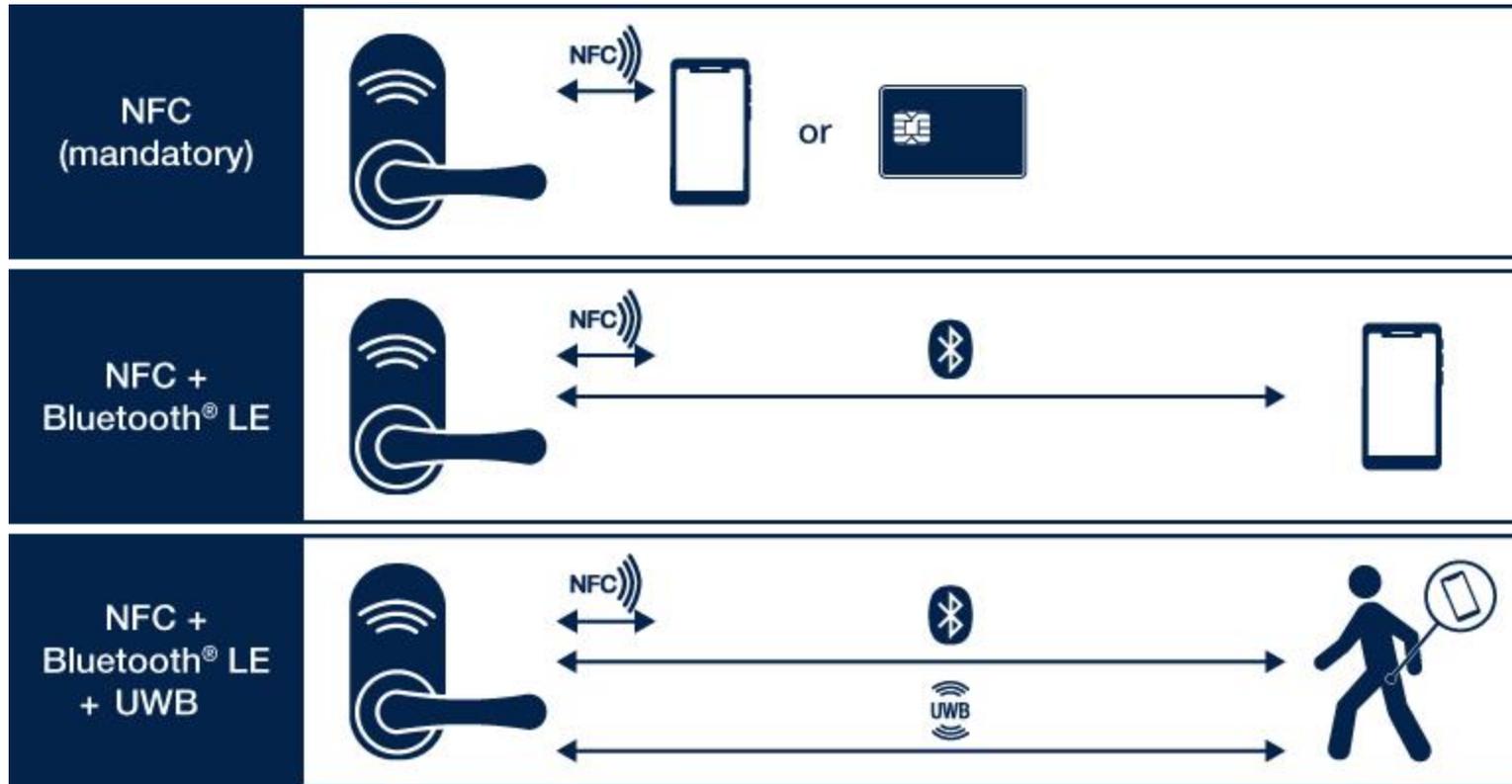
Industrial

Hospitality

Commercial

Residential

Airo standard connectivity architectures



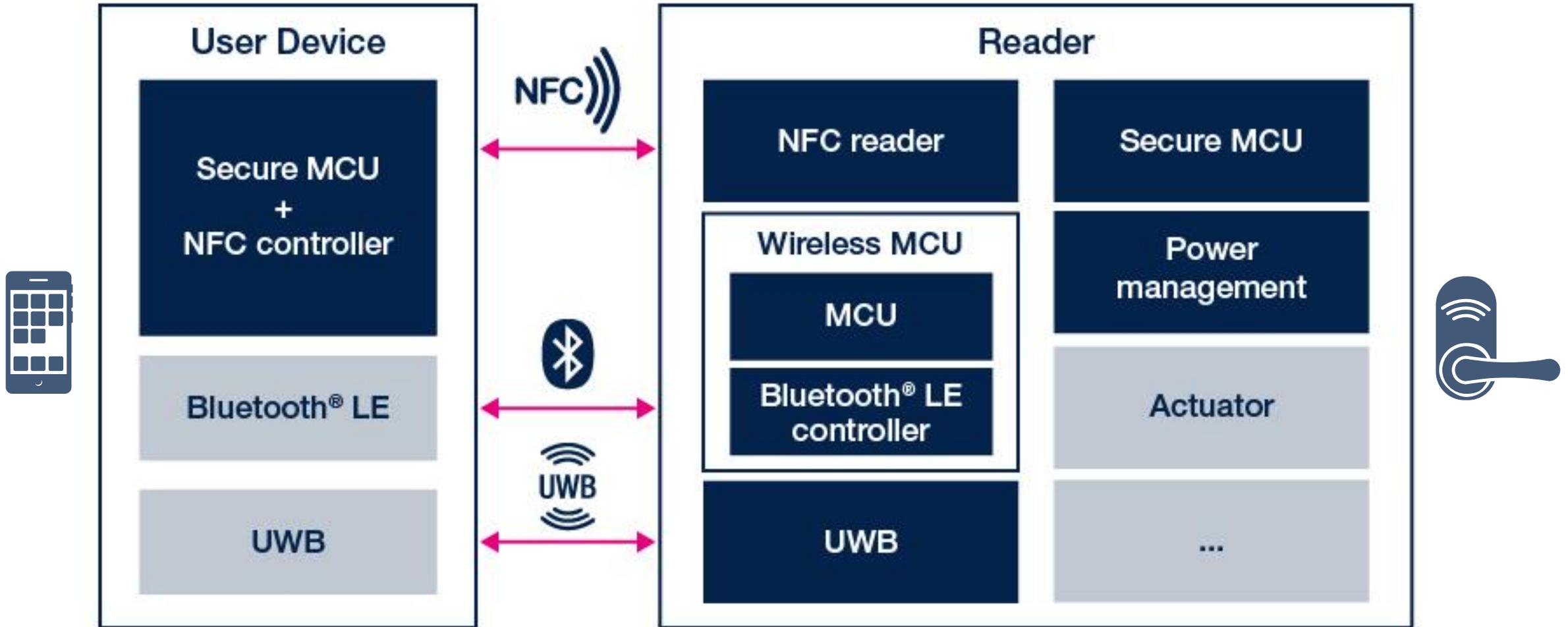
A reliable solution for contactless tap-and-go access with a smartcard or smartphone.

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 AiRo

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				ST UWB*	



*Sampling now

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



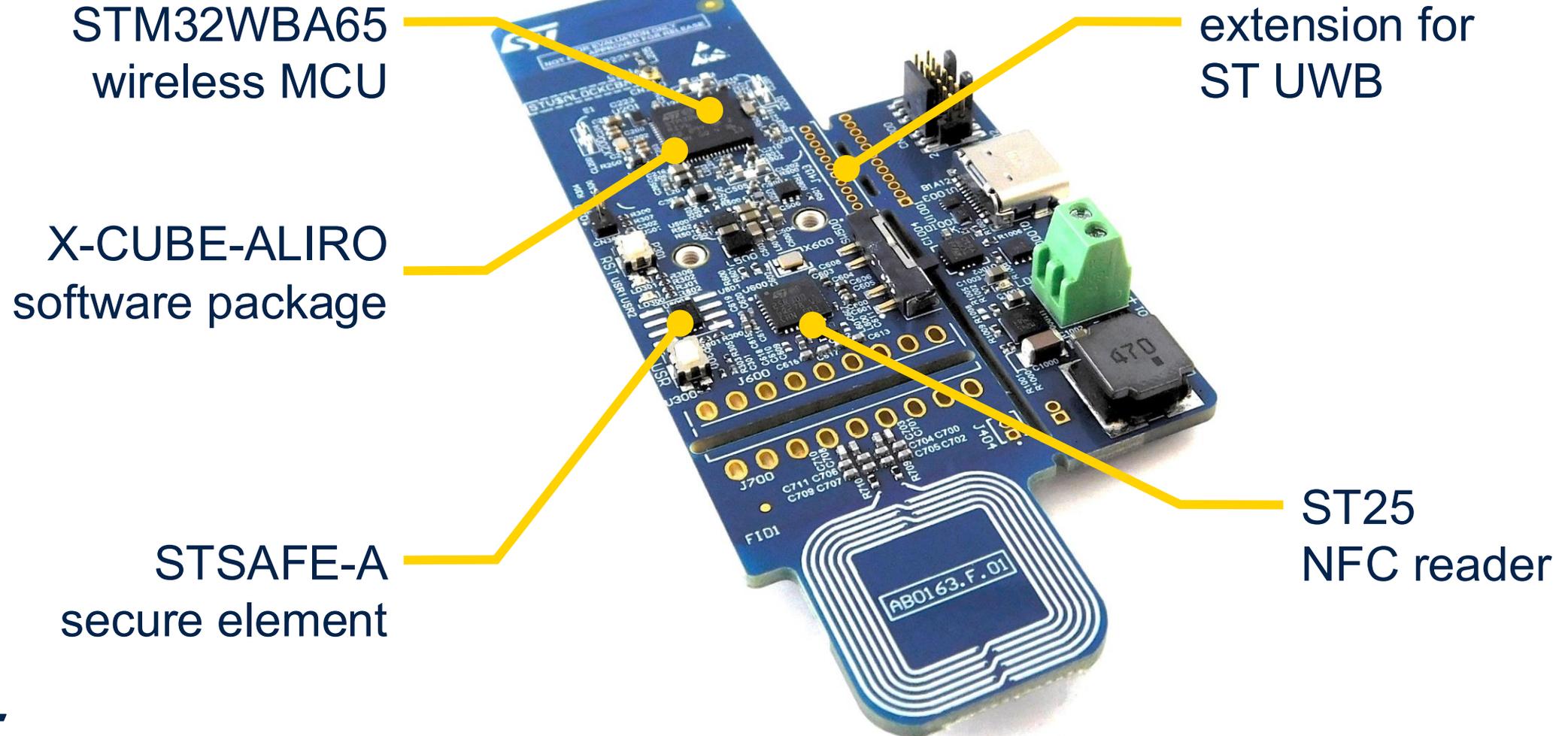
Complete ecosystem

Resources for faster platform development and certification

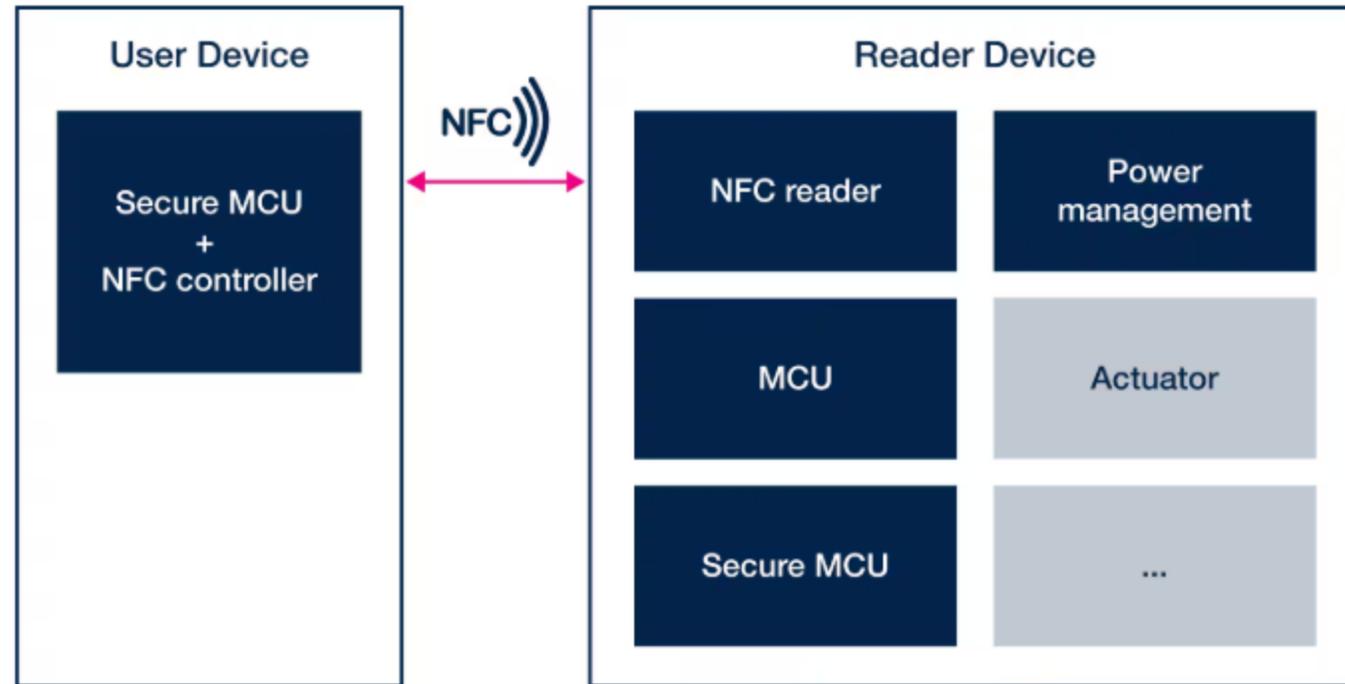


STEVAL-ALOCKCB reference design

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

SPI

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 2.7V to 5.5 V
- Antenna driver voltage range, up to 6 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

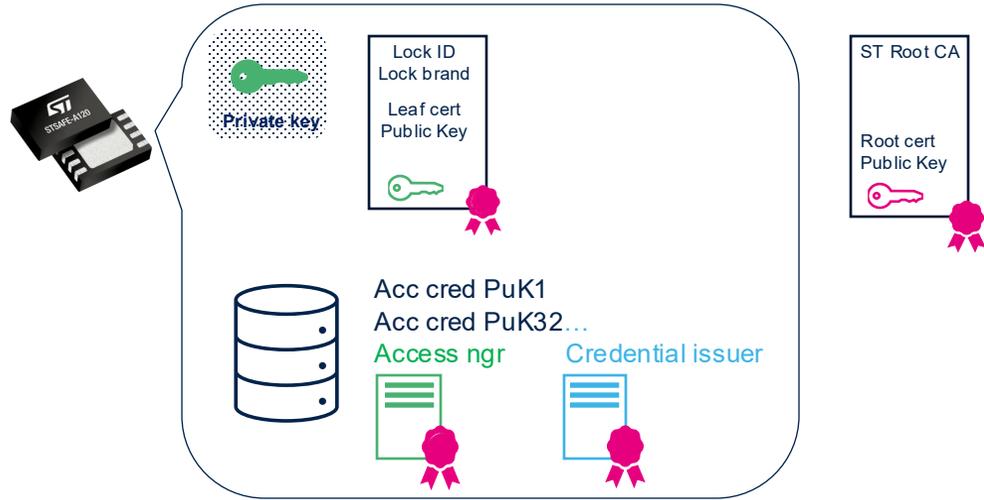
- Customer certificate and keys personalization at ST secure factory
- MOQ 5Ku



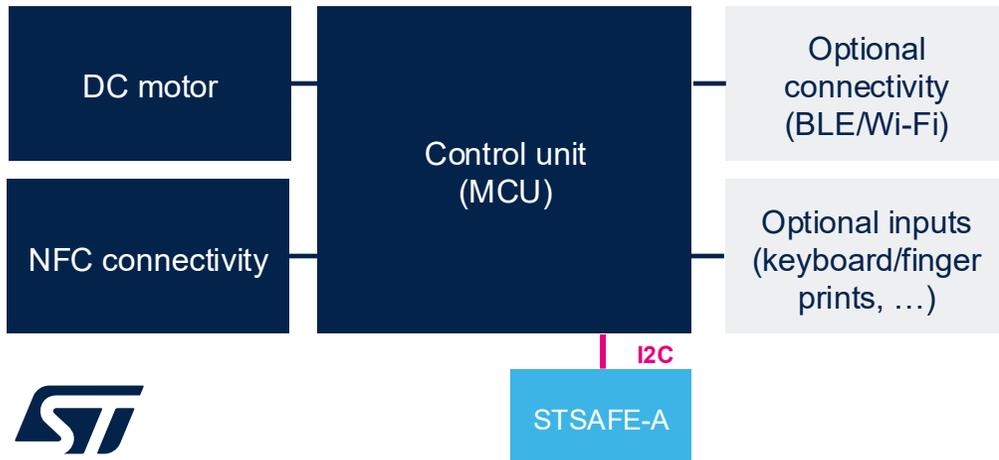


Enhance Aliro platform security with STSAFE-A120

Deliverable



Integration in lock



STSAFE-A

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

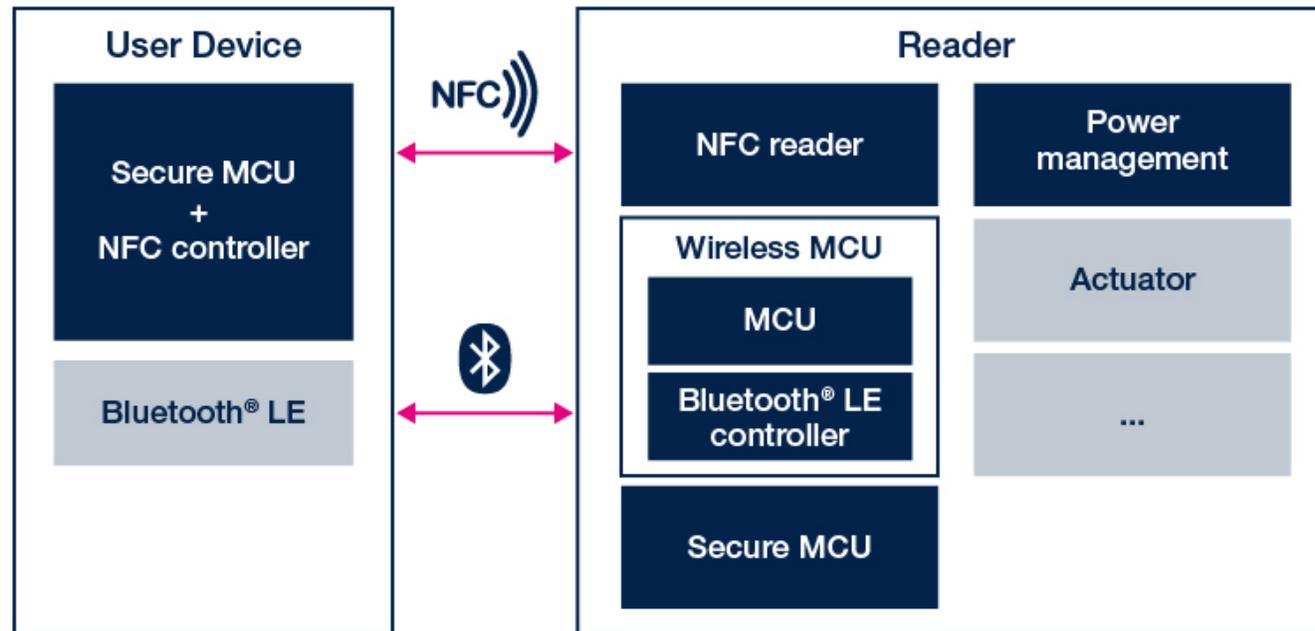
- Lock authentication and attestation with a “Lock maker” preloaded Matter compliant X.509 certificate

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)

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

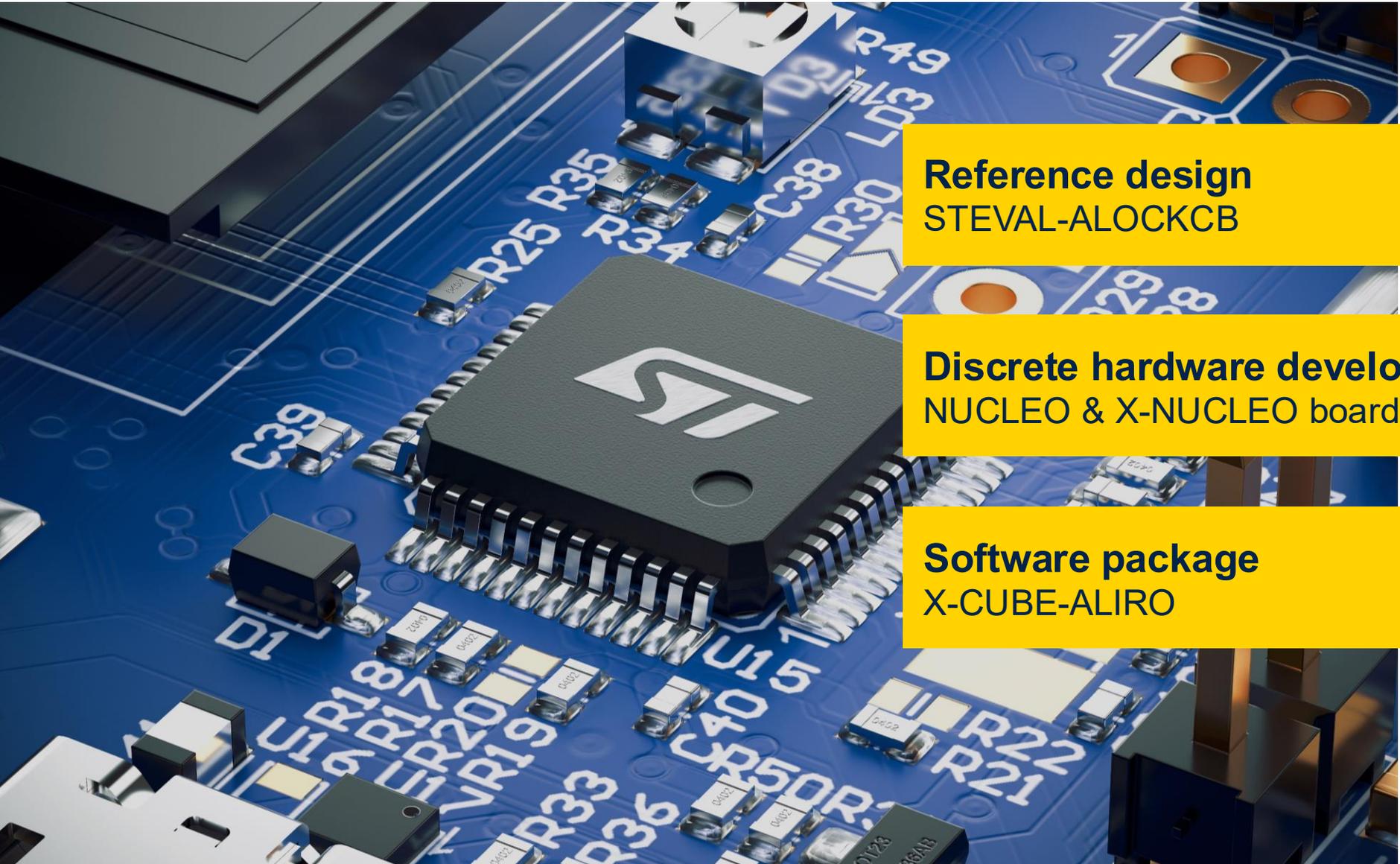
STM32Trust security framework

Jump-start your project

with an STM32 MCU

Follow these few simple steps to get started.

Complete ecosystem ready for Aliro

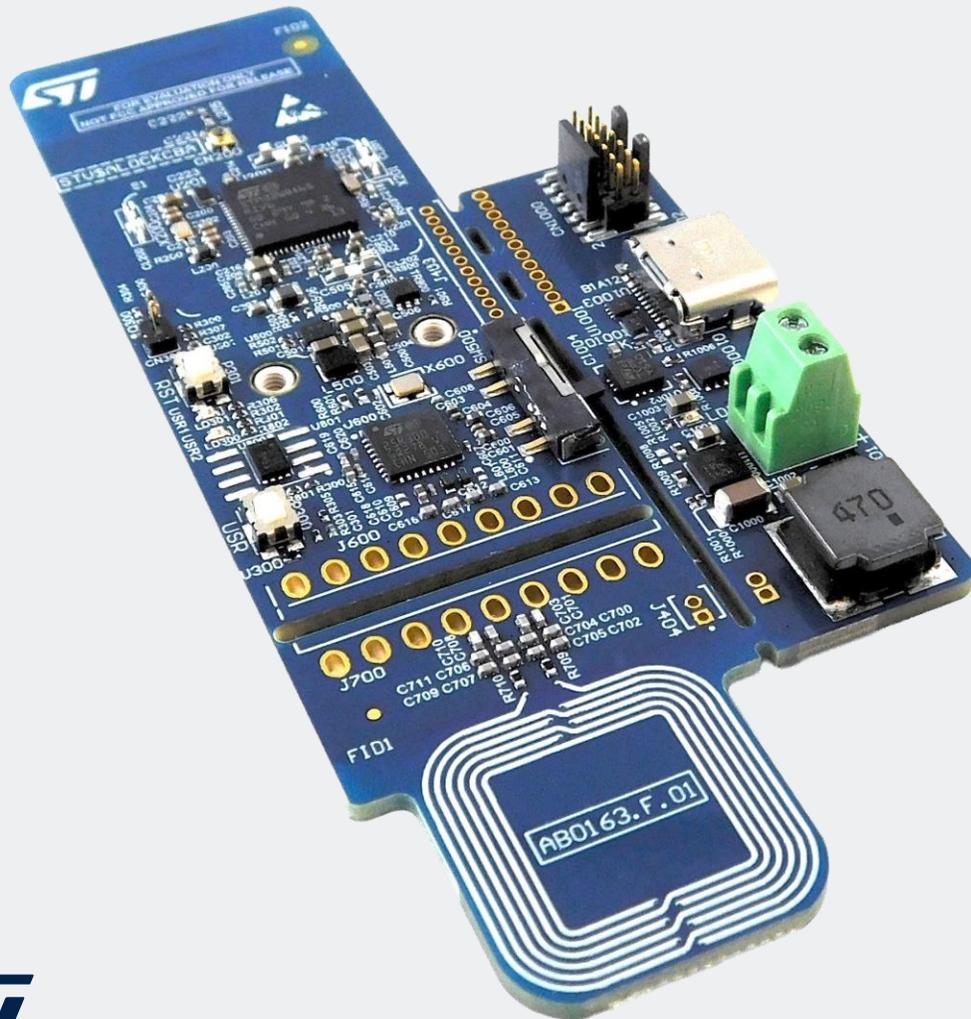


Reference design
STEVAL-ALOCKCB

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

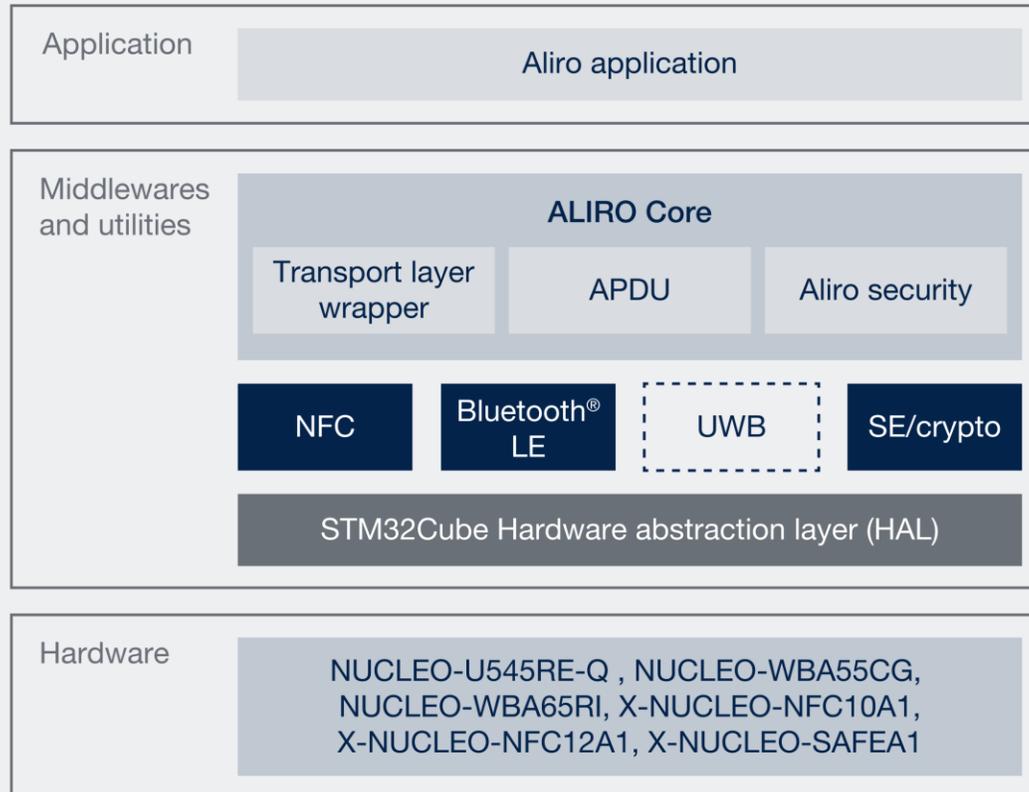
Protocols supported	NUCLEO-U545RE-Q	NUCLEO-WBA55CG	NUCLEO-WBA65RI	X-NUCLEO-NFC10	X-NUCLEO-SAFE1
NFC-only	✓			✓	
NFC-only and/or NFC + Bluetooth® LE		✓		✓	
NFC-only and/or NFC + Bluetooth® LE with secure key storage		✓		✓	✓
NFC-only and/or NFC + Bluetooth® LE with Matter			✓	✓	

All discretos 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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