

Authentication, settings, and experience

ST NFC solution: Reader+Tag



NFC readers



NFC tags



Tools for data management





Benefits of using ST25 Reader+Tags



Perfect combination

of well-matched ST25 reader and tags within products and product peripherals



Proven solution

for products in consumer and industrial markets using accessory, consumables and batteries



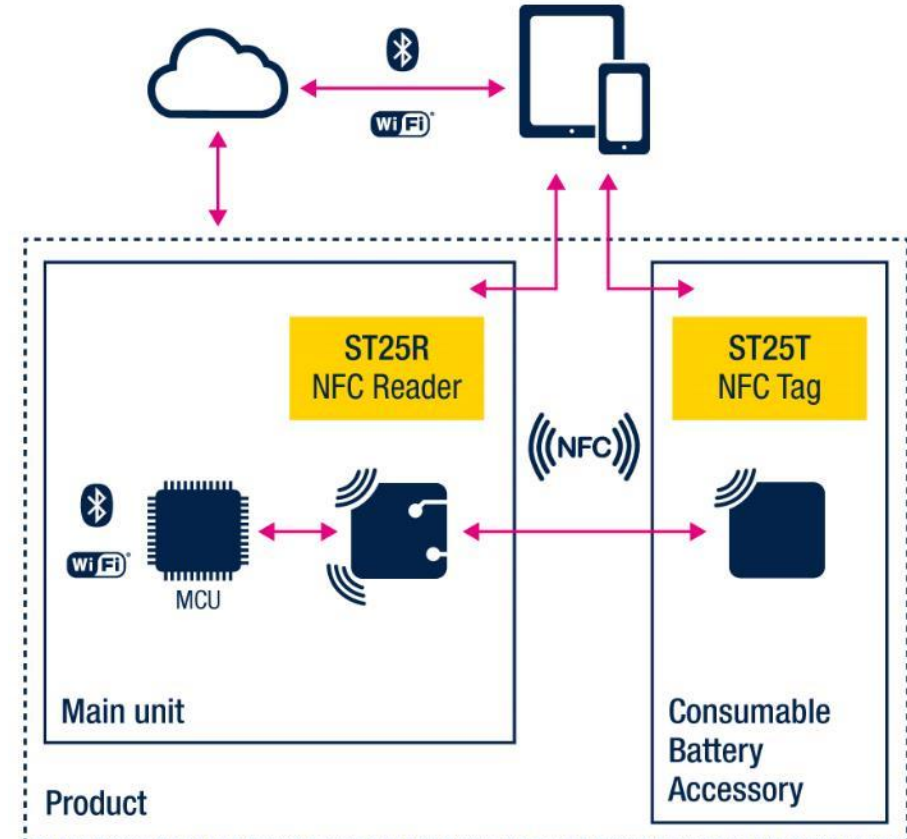
Scalability

through enablement of connectivity for user engagement and product functionality



Best size, best price

Low BOM costs and small form-factor ensure easy integration of NFC into products





Main market segments

Medical & Healthcare



lab equipment – medical test kits – dispenser
drug & asset management

Beauty & Lifestyle



toothbrush – hair & body care devices
e-cigarette – aroma diffuser

Kitchen & Home Appliances



blender – vacuum cleaner – humidifier
smart fridge – coffee machine

Home Automation



smart devices – metering – smart lock
sensing – smart furniture

Gaming & Education



game consoles – figurines – board games
RC vehicles – dolls

Tools

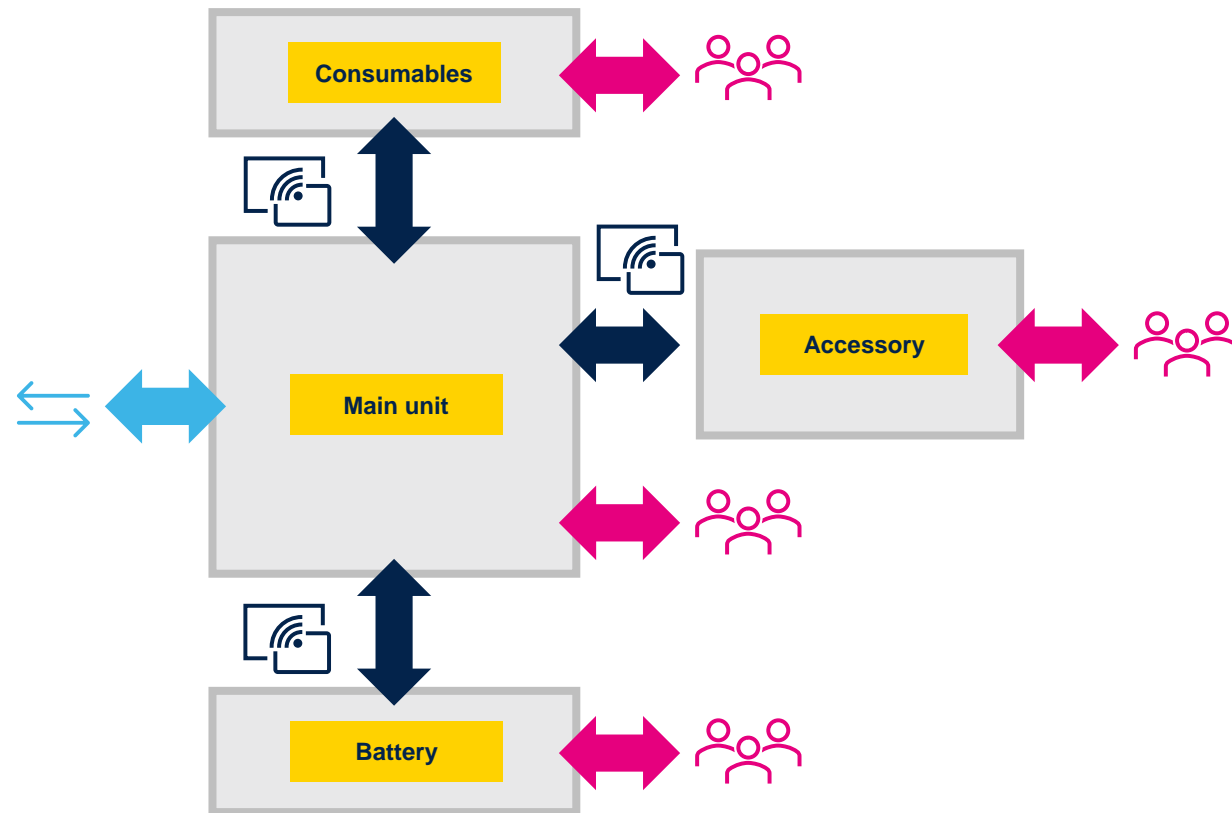


power drill – disk grinder – pressure washer
buzzsaw – buffer machine



NFC Reader+Tag use cases

Enable interaction and connectivity with every component of your product



Consumer interaction



Purchase convenience
Consumer engagement

Device interaction



Device authentication
Firmware update
Brand recognition
Parameter setting
Usage logging

External interaction

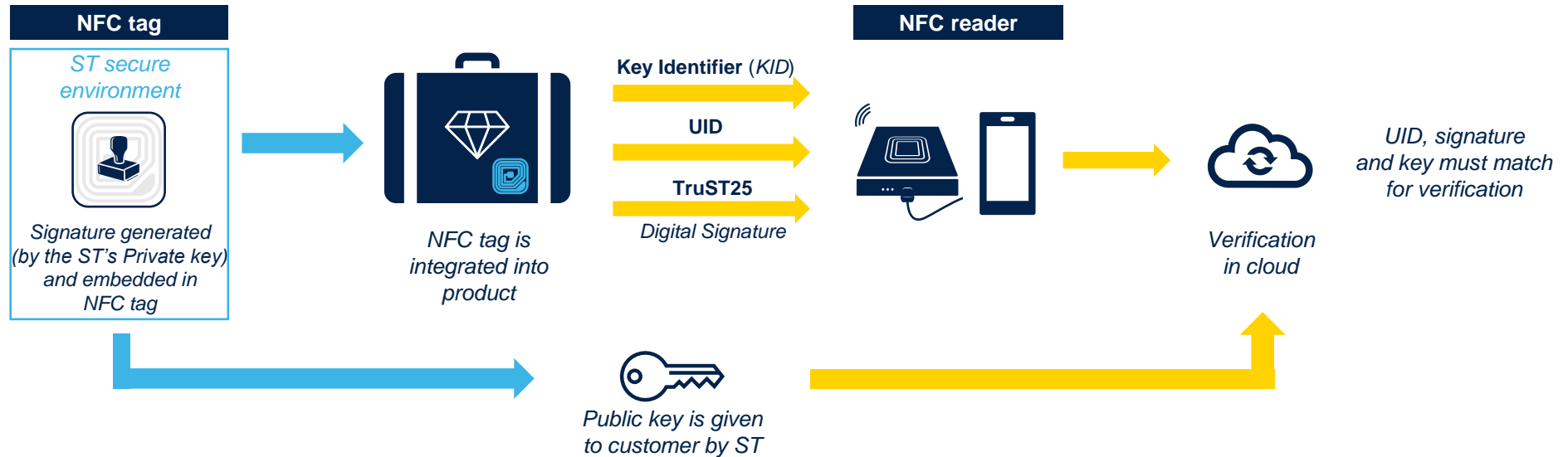


Device pairing
Access control
Inventory tracking



Device authentication & brand recognition

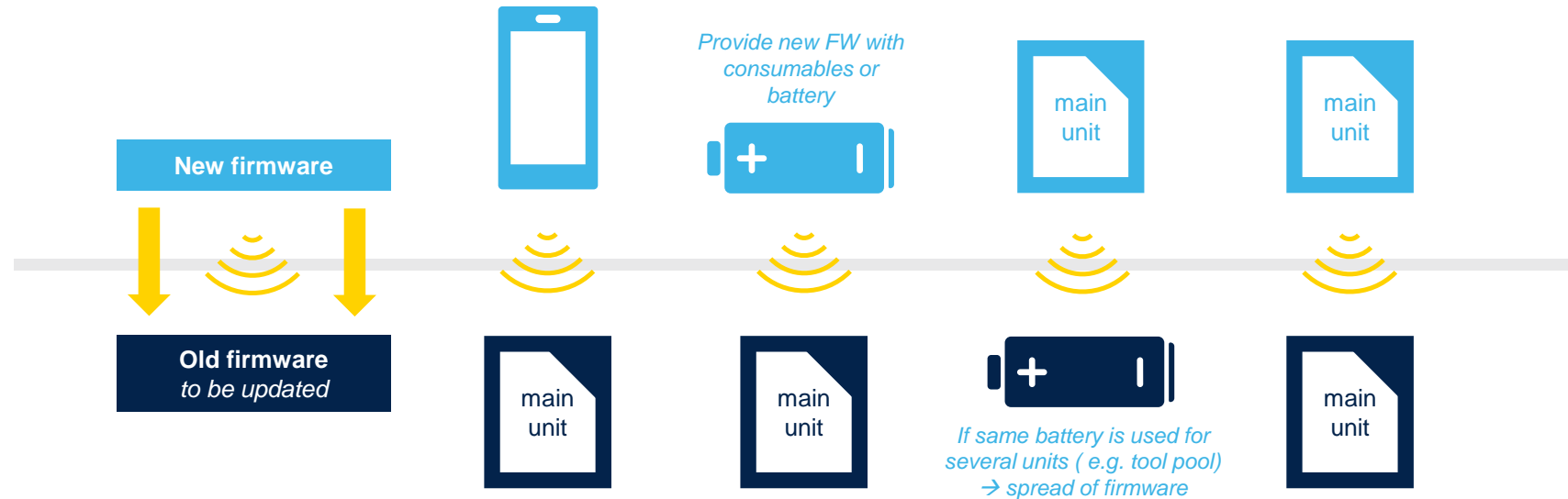
Verify integrity of products and consumables & authenticate their origin with a unique identifier (UID) and the TruST25™ digital signature.
Ensure safety through usage of genuine components and preventing low quality or third-party products.





Firmware update

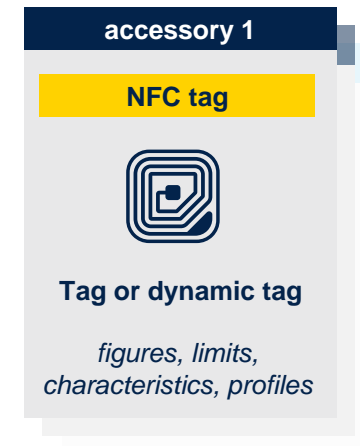
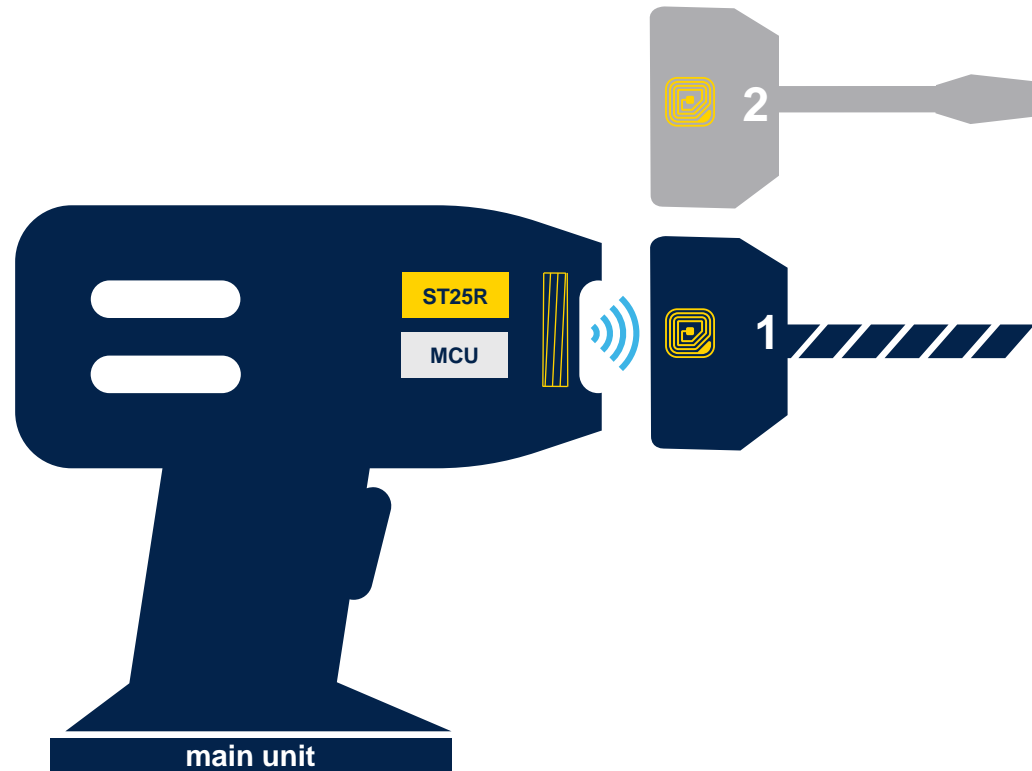
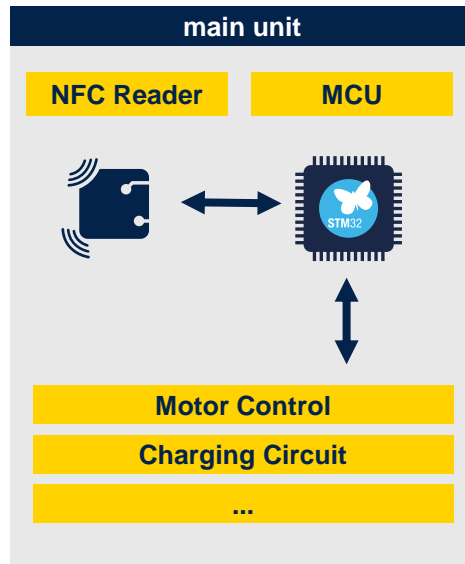
Keep your product's firmware up to date by providing updates via new consumables or batteries. Synchronize firmware of shared devices via multi-directional firmware exchange.





Parameters setting

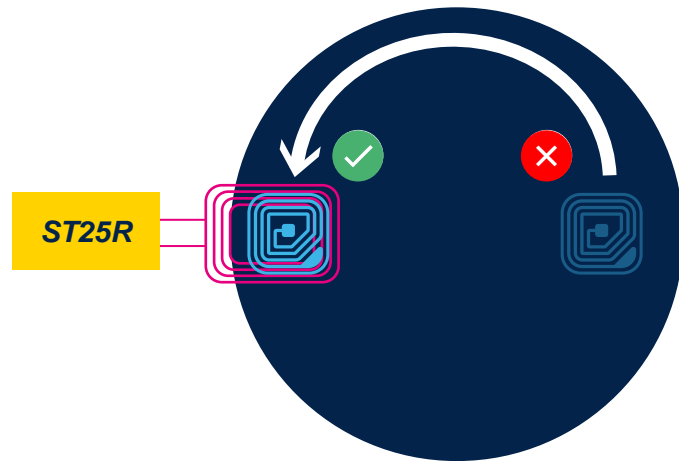
Automatically recognize accessory and adjust unit parameter to ensure ideal and efficient system functionality. No pre-programming necessary, since new parameters come with the integrated tag of each accessory.



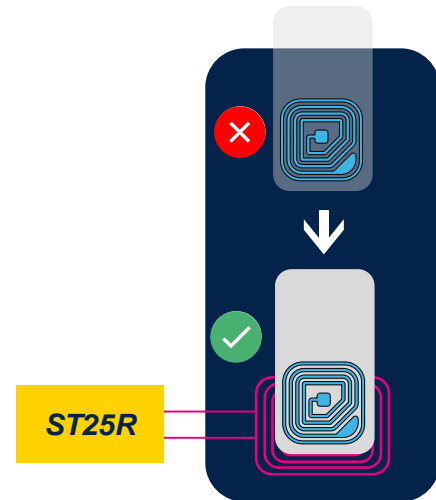


Mechanical safety

Enhance product safety with NFC enabled mechanisms, which verify the positioning and alignment of mechanical parts. Enable wireless communication over short distances in critical environments.



Rotate & Lock



Insertion
RSSI measurement



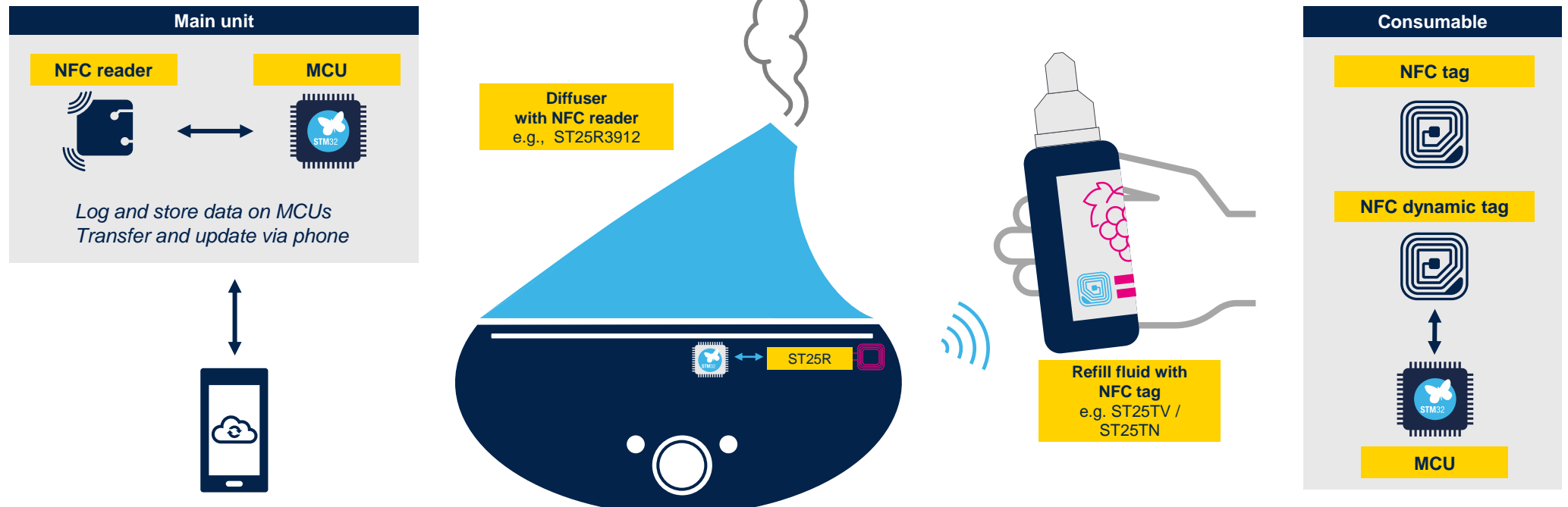
Isolated gap
communication

*wireless communication without
physical path (drillings, tubes, wholes,...)*



Customer behavior tracking

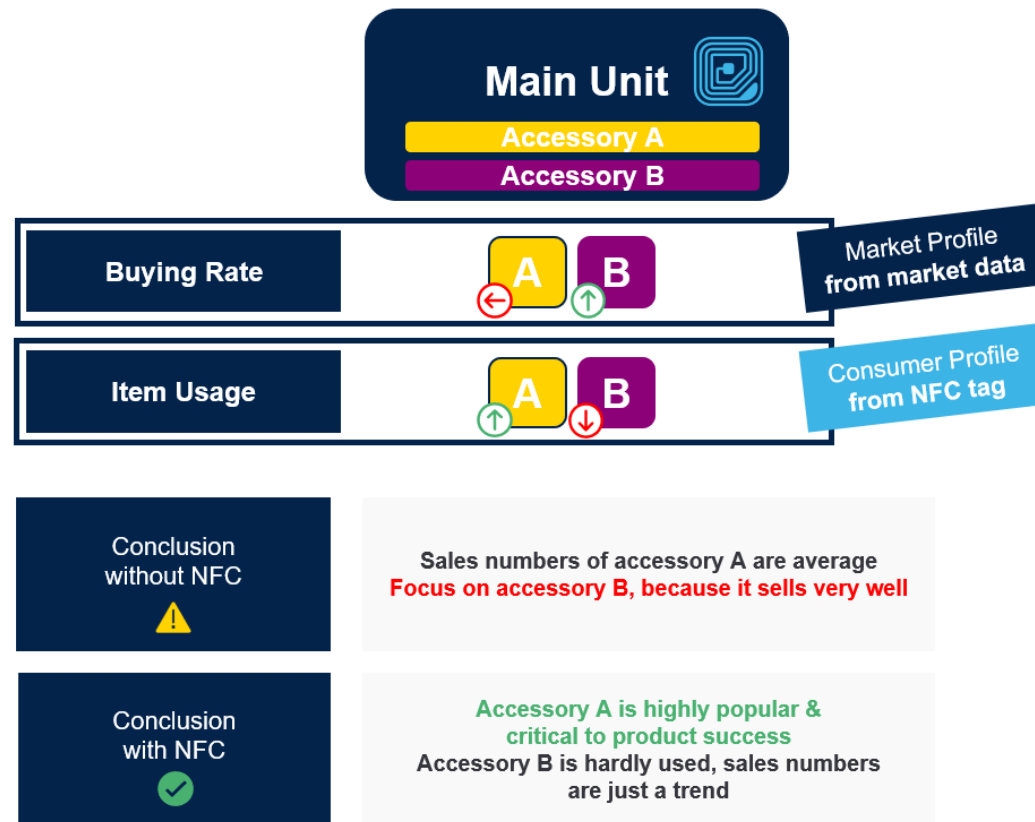
Understand your customers better by recording their usage pattern, preferences and more.
Detect and adapt faster to changes in customer behavior or needs.





NFC data as supplement to market data

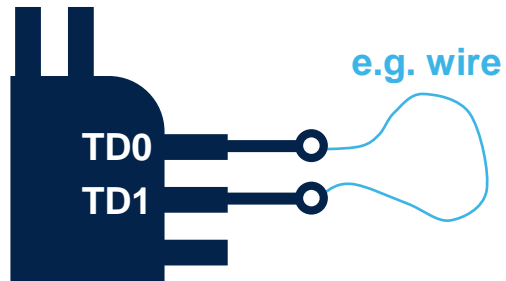
Make more profound management decisions and optimize your product portfolio with new insights from tracking customer behavior and logging use patterns via NFC.





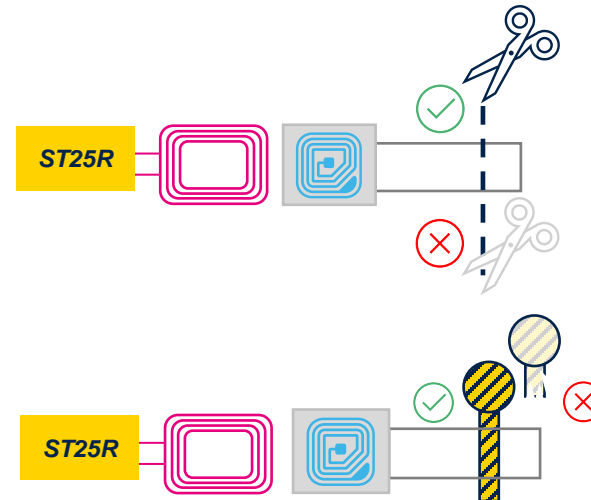
Tamper detection

Use tamper detection feature of ST25 tags to ensure proper handling and integrity of products.
Tamper pins enable variety of different seal options.



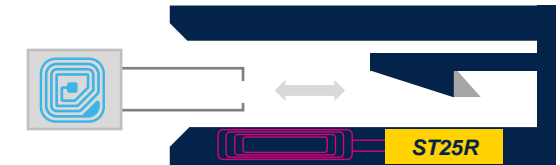
Tamper detection with ST25T tags

Detection of open or short circuit
on tamper pins



Tear or wire seal

removal of unit will tear seal or wire and
invalidate product for reuse or refill



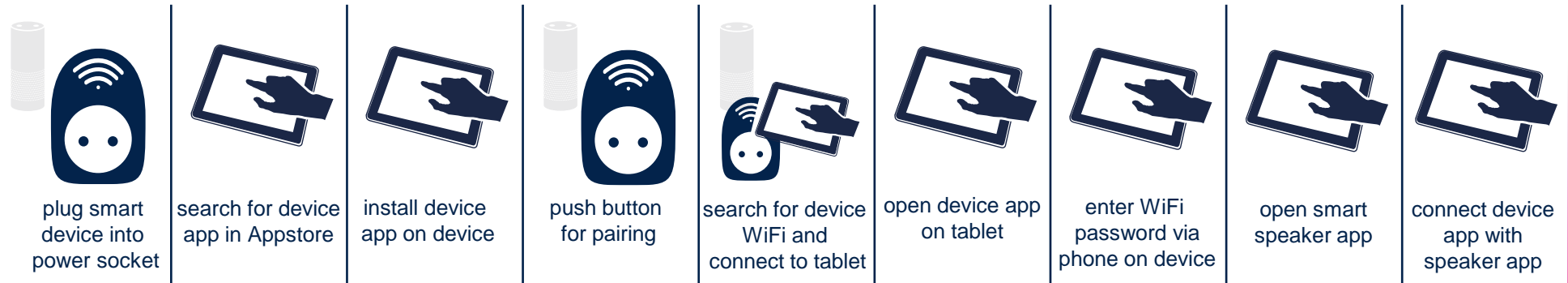
Insertion seal

removal of unit will tear insertion seal
and invalidate product for reuse or refill



Device pairing with NFC

Pairing without NFC



Pairing with NFC



~10 min
9 steps
no interaction with speaker

~1 min
2 steps
speaker has central function

Pairing feature also for game consoles, TVs, remotes and many other devices



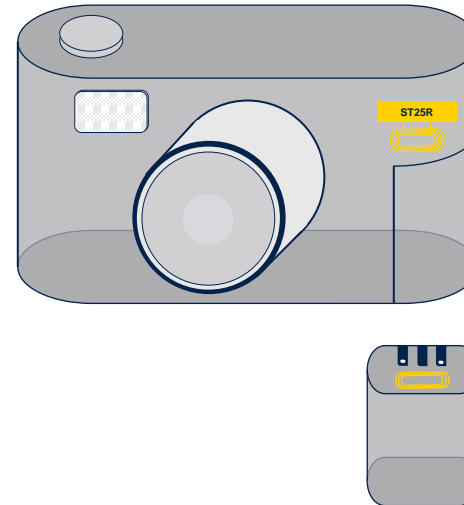
Examples for Reader+Tag applications

Air purifier & aroma diffuser



Air purifier with reader e.g. ST25R3918
Replacement filter with NFC tag e.g. ST25TV / ST25TN

Cameras & action cams



Camera with NFC reader e.g. ST25R3918
Battery or flash with NFC tag e.g. ST25DV-I2C

Game consoles & accessories

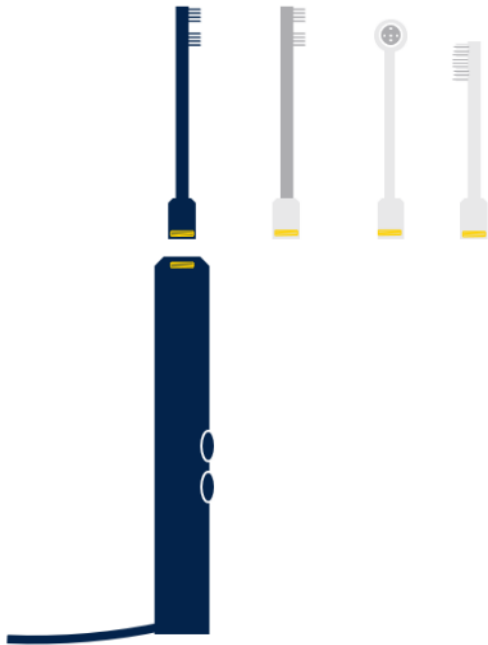


Game controller with reader e.g. ST25R3918
Action figures with NFC tag e.g. ST25TV / ST25TN



Examples for Reader+Tag applications

Toothbrushes



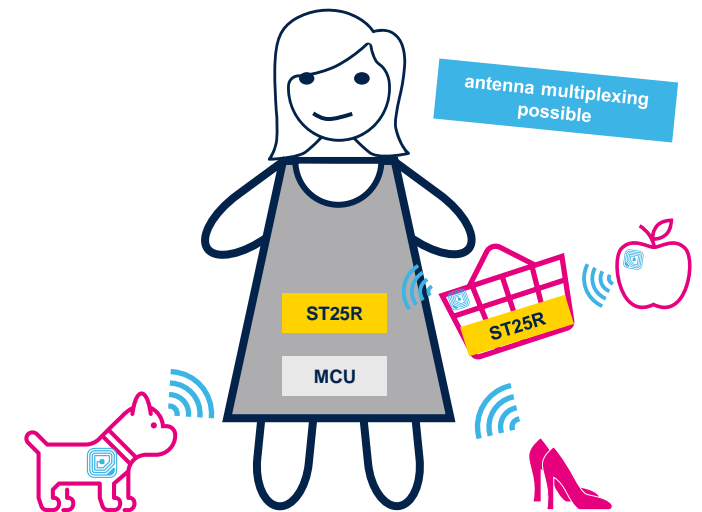
Main unit with reader e.g. ST25R3918
Replacement brush with NFC Tag e.g. ST25TV / ST25TN

Coffee machine



Coffee machine with NFC reader e.g. ST25R3918
Capsules with NFC tag e.g. ST25TV / ST25TN

Dolls & actions figures



Doll with reader e.g. ST25R3918
Various Accessory with NFC tags e.g. ST25TV / ST25TN





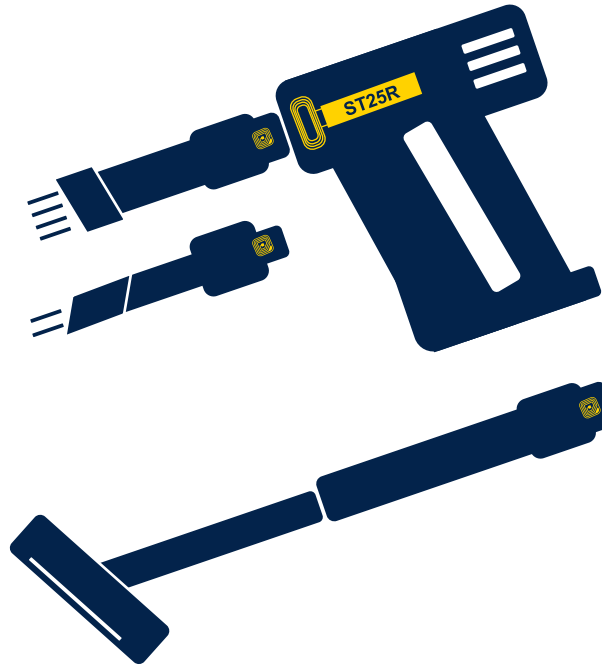
Examples for Reader+Tag applications

E-cigarettes



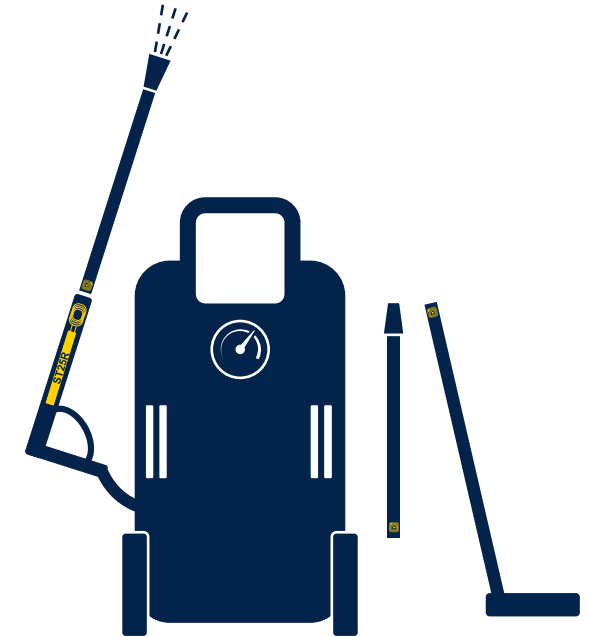
Main unit with reader e.g. ST25R3918
POD / battery with NFC tag e.g. ST25TV / ST25TN

Vacuum cleaner



Vacuum cleaner with NFC reader e.g. ST25R3918
Accessories and bag with NFC tag e.g. ST25TV / ST25TN

Pressure washer



Main unit with NFC reader e.g. ST25R3918
Washer nozzles with NFC tags e.g. ST25TV / ST25TN





ST25R NFC / HF readers product family

		NPI 2024				NPI 2024
	ST25R95	ST25R100	ST25R3911B/12	ST25R3916B/17B	ST25R3918	ST25R300
Description	Entry-Level NFC reader	Entry-Level NFC reader	Mid-Range NFC Reader	High-performance NFC Reader	Multi-purpose NFC Reader	High-performance NFC Reader
Reader/Writer mode	ISO14443A/B ISO15693 Felica	ISO14443A/B ISO15693	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693	ISO14443A/B ISO15693 FeliCa
Card emulation mode	Yes	-	-	Yes (16B)	Yes	Yes
AP2P mode	-	-	Initiator & Target	Initiator & Target (16B)	-	Yes
PP2P mode	-	-	Initiator	Initiator & Target (16B)	Initiator & Target	Yes
RF speed	424kbps	106Kbps	848kbps	848kbps	848kbps	848Kbps
Market	Consumer	Consumer, Industrial	Industrial, Access control, Consumer	EMVCo®, WLC Industrial, Consumer	Reader+Tag, IoT, Gaming, Consumer	EMVCo, WLC, Industrial, Consumer
Advanced features	IWU	DPO, IWU	AAT (11b), DPO, CIWU	AAT (16B), DPO, NSR, DSA, AWS, IWU, EMD	DPO, NSR, DSA, AWS, IWU, EMD	DPO, LRWU, NSR, EMD, AWS, ATT
HW interface	SPI 2Mbps	SPI 6Mbps	SPI 6Mbps	I ² C & SPI 10Mbps	I ² C & SPI 10Mbps	SPI 10Mbps
SW interface		RFL Unified Software Library for NFC Front Ends				
Power supply	2.7V - 5.5V	2.7V – 3.6V	2.4V – 5.5V	2.4V – 5.5V	2.4V – 5.5V	2.7V – 6.0V
Output power	0.23W	0.8W	1.4W (11B) – 1.0W (12)	1.6W	0.5W	2.2W
Temp range	-25°C to +85°C	-25°C to +85°C	-40°C to +125°C ^(J)	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C ^(A)
Package	32-pin QFN	24-pin TQFN	32-pin QFN / Wafer / WLCSP (12)	(WF) 32-pin QFN / WLCSP-36	(WF) 32-pin QFN	32-pin 5x5 TQFN



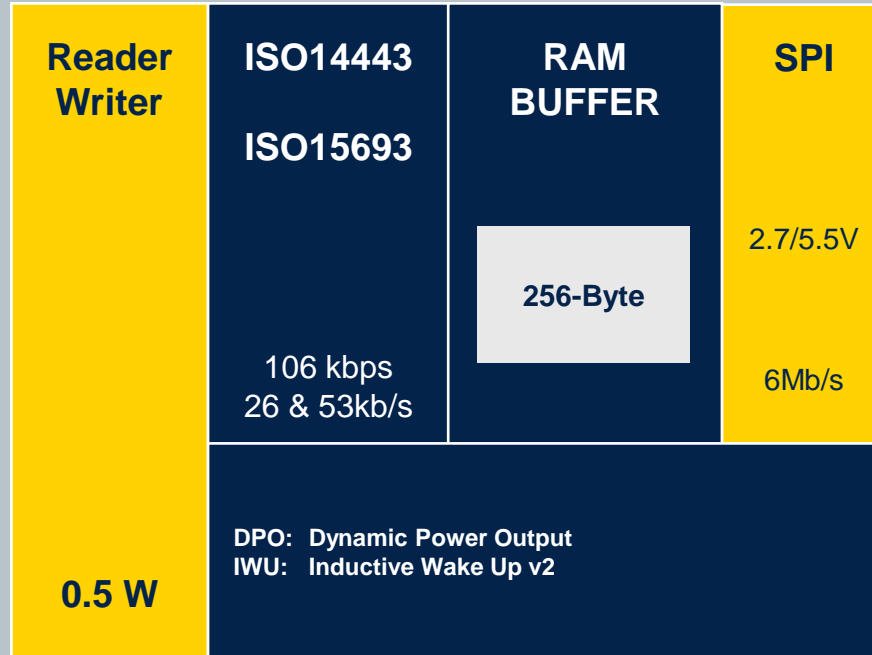


ST25R100

Entry-level NFC reader




ST25R100



TQFN24

Use cases

- Ideal for **Reader+Tag** applications 
- Consumer applications, Access control, Transportation
- Accessory recognition, Brand protection, Parameter setting

Key features

- **0.5 W** dynamic output power
- -25°C to 85°C ambient temperature
- Up to 165 mA via internal LDO
- **Improved inductive wake-up** function
- Small 4x4mm TQFN package

Key benefits

- Tiny package size for easy integration into applications
- Low power operation & great card detection range
- Optimized for cost conscious applications

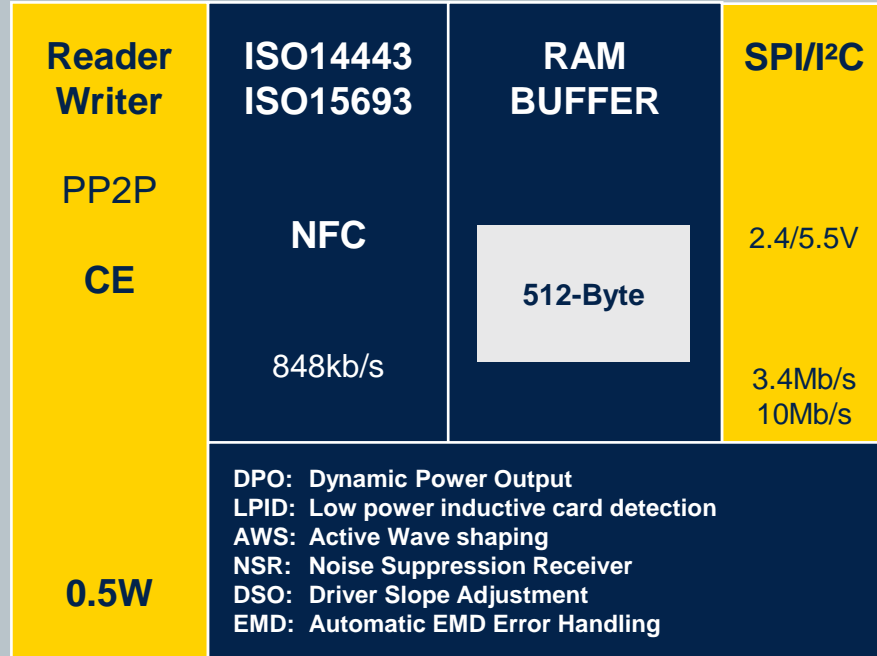


ST25R3918

Multi-purpose NFC transceiver



ST25R3918



QFN32
Wettable flank

Use cases

- Ideal for **Reader+Tag**
- Access control, Gaming, Consumer
- Apple AppClip; Android InstantApp

Key features

- **0.5 W** dynamic output power
- **Active Waveshaping, Noise Suppression Receiver**
- **Low Power Tag Detection**
- **-40°C to 85°C** ambient temperature range

Key benefits

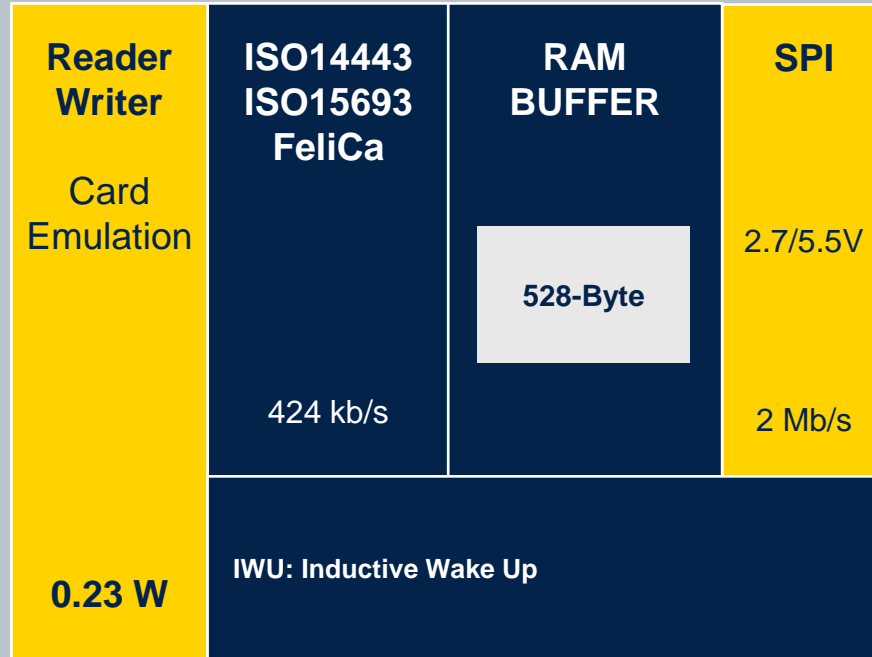
- Low power operation & Standby mode
- Works in challenging environment like noisy LCD displays
- Excellent performance for low power applications
- CE mode allows easy start & interface with application on phones



ST25R95

Entry-level NFC reader solution

ST25R95



QFN32

Use cases

- Smart locks, Card readers
- Gaming and toys
- Dynamic wireless pairing with hand-over

Key features

- **Reader-Writer** (R/W) and **Card Emulation** (CE)
- All NFC modes supported (ISO14443, ISO15693, FeliCa)
- Fast data transfer (up to **424 kb/s**)

Key benefits

- Simple implementation
- Easy-to-use evaluation with development kits
- Reference designs, application notes
- Cost effective solution

ST25 NFC / RFID portfolio

one-stop-shop for tags and readers

Tags				Dynamic tags		
ST25TA	ST25TB	ST25TN	ST25TVC	M24SR	ST25DVC-I2C *	ST25DV-PWM
ISO14443-A 106 kbps NFC Type 4	ISO14443-B 106 Kbps	ISO14443-A 106 kbps NFC Type 2	ISO15693 up to 53Kbps NFC Type 5	ISO14443-A 106 kbps NFC Type 4	ISO15693 up to 53 kbps NFC Type 5	ISO15693 up to 53 kbps NFC Type 5
EEPROM 512b-64Kb 200-year retention 1M cycles	EEPROM 512b-04Kb 40-year retention 1M cycles	EEPROM 512b-1.6Kb 40-year retention 100k cycles	EEPROM 512b-64Kb 60-year retention 100k cycles	EEPROM 2Kb-64Kb 200-year retention 1M cycles	256B Buffer EEPROM 4Kb-64Kb 40-year retention 1M cycles	EEPROM 2Kb 40-year retention 100k cycles
TruST25 digital signature 128b password 20b counter UID RF Field Detect	32b counter Lock OTP bits UID	Augmented NDEF TruST25 digital signature 24b UTC UID	Augmented NDEF TruST25 digital signature 64b password 24b UTC UID Tamper Detect	128b password RF disable RF Detect UID	Fast X-fer Mode 64b password E-Harvesting RF Detect UID	TruST25 digital signature 64b password UID
				I2C 1MHz 2.4V-5.5V	I2C 1MHz Write 16B page 1.8V-5.5V	2x PWM 488-31.25 kHz 1.8V-5.5V
SBN12 / SBN075 / FPN5	SBN12	SBN12 / SBN075 / FPN5	SBN12 / SBN075 / FPN5	SO8 / TSSOP8 / FPN8 / SBN12	SO8 / TSSOP8 / FPN8 / FPN12 / WLCSP10	SO8 / TSSOP8

*: successor of M24LR
and ST25DV-I2C

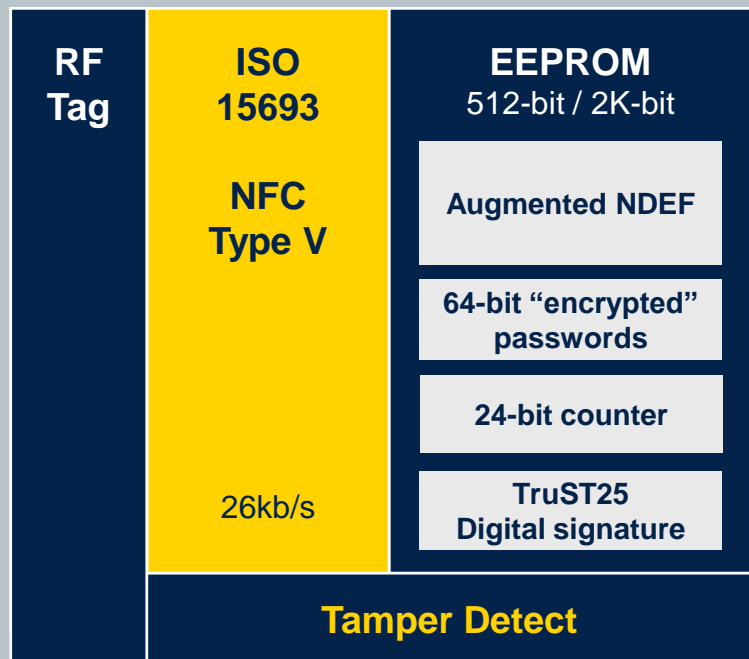


ST25TV

NFC type 5 tag with Augmented NDEF



ST25TV512C / 02KC



FPN5



SBN12 / SBN075

Die form, sawn and Bumped inkless 8" wafer, 120µm/75µm thickness

Use cases

- Product Identification, asset tracking, consumer engagement, access control, gaming
- Tamper proof application, brand protection

Key features

- ISO15693 and **NFC Type V** (long range operations, 26kb/s)
- Memory configuration : 512-bit and up to 2560-bit
- **TruST25 Digital Signature** (can be used into ANDEF : 2K-bit only)
- 24-bit **Unique Tap Code (UTC)** with anti-tearing
- Untraceable (by default possible) & Kill modes
- Tamper Detect pin for open / short detection
- **Augmented NDEF**: UID, UTC, tamper status, signature, password counter...

Key benefits

- Configurable User Memory Area
- Cloning Protection with Digital Signature (Cloud management)
- **60 years** data retention, **100k cycles** erase/write



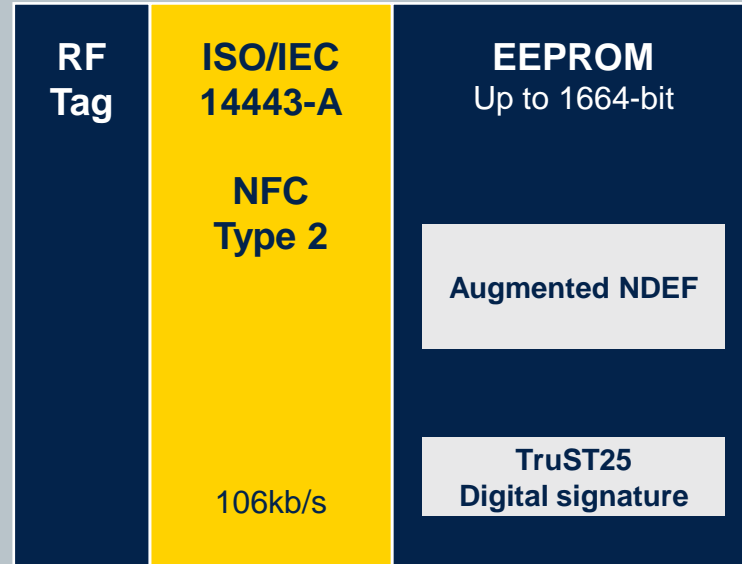


ST25TN

Entry level NFC type 2 tag



ST25TN512 / 01K



UFDPN5



SBN12 / SBN075

Die form, sawn and Bumped inkless 8" wafer, 120µm/75µm thickness

Use cases

- Product configuration, accessory recognition, smart poster, gaming
- NFC consumer engagement, NFC token

Key features

- **ISO/IEC 14443-A and NFC Type 2 Tag**
- High speed operations (**106 kb/s**)
- **Memory configuration** : 512-bit and 1280-bit (up to 1664-bit depending on features usage)
- 24-bit **Unique Tap Code (UTC)** with anti-tearing
- **Customizable Augmented NDEF** with UID and UTC
- **TruST25** digital signature



Key benefits

- Tiny DFN5 package (1.7 x1.4 mm)
- 50 pF internal RF tuning capacitor allowing small antenna design
- **40 years** data retention, 100K cycles erase/write
- Cost effective applications

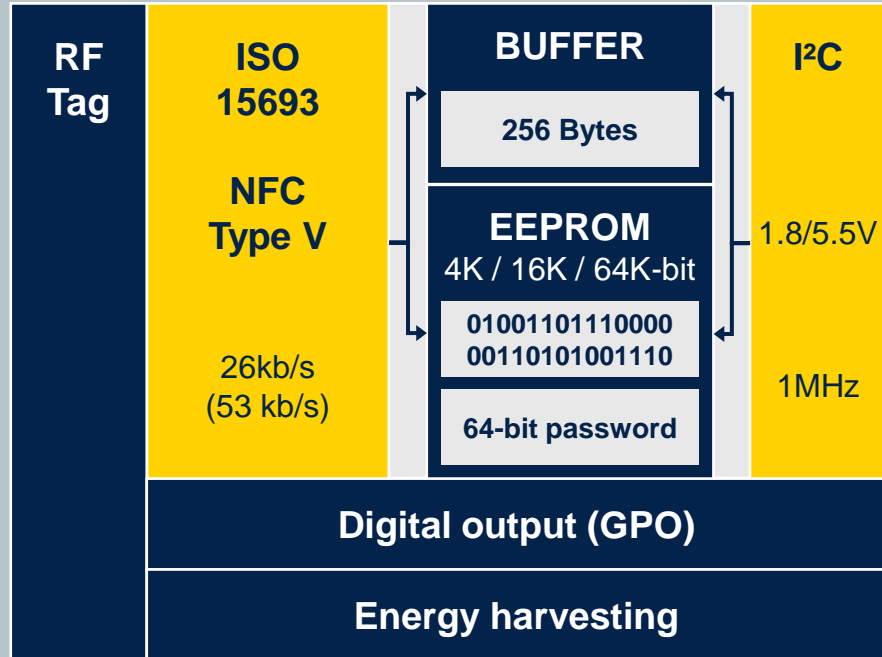


ST25DV-I2C-EVO

dynamic NFC tag



ST25DV04KC / 16KC / 64KC



SO8



FPN8



WLCSP10



TSSOP8



FPN12

Use cases

- Fast data exchange with NFC phones / HF readers
 - Fast data transfer for MCU FW upgrade, fast data exchange
 - Parameters settings and update, with in-the-box programming
 - Data log download

Key features

- **ISO15693** and **NFC Type V**
- **Fast data transfer** thanks to 256 Bytes buffer
- I2C write on **16-Byte page**
- Low Power mode, < 1µA power consumption in Standby
- -40 to **+125°C** (I2C) industrial Grade 8 temperature range
- **Energy harvesting** function through RF
- I2C enhanced features (write time improved, address configurable, access priority...)

Key benefits

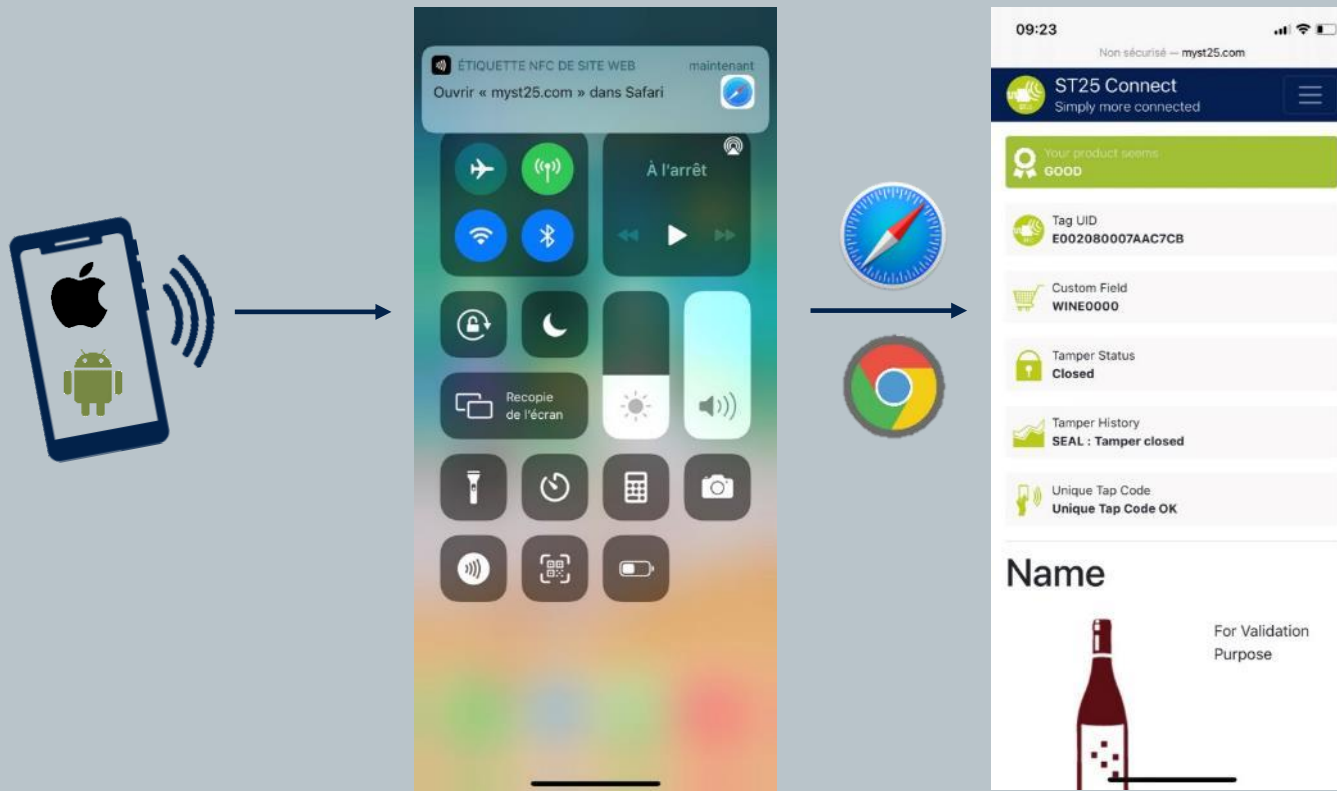
- Smart applications using a **flexible interrupt GPO**
- Enhanced protection with multiple **64-bit passwords**
- Same 28.5 pF internal RF tuning capacitor, as in ST25DV-I2C & M24LR





ST25 Webserver

ST25 Webserver demo for ST25 NFC tags



- Open-source webserver: www.myst25.com
- Compatible with ST25TV and ST25TN product series
- Augmented NDEF experience
- Native and automatic access to NDEF records
- Shared with customers on specific request and through MFT platform (SLA0085 process)
- Developed in HTML5 and PHP7.0 – Uses MySQL database
- Source code can be shared on request

ST solutions



• ST25 tags



bitse.io | Connecting Product Cloud

A powerful IoT platform combining its IoT tags spanning RFID, NFC, BLE and other active engagement solutions with capabilities for tag commissioning, consumer experience, and data management.

The platform enables:

- Serialized IDs for every product with a digital customer audit trail
- Ability to leverage Identiv's proprietary encoding capabilities along with an open-market SDK for the developer community
- Consumer utilization of the many APIs for ERP and CRM systems for ongoing data flow and insights
- Full suite of data and analytics built on flexible tool sets
- Robust brand engagement
- Brand protection describing authenticity and product diversion

