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新一代NFC标签提升追踪溯源的安全性

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Oct 2021





NFC technology at a glance

An interactive technology enabling engagement with IoT devices

- Near Field Communication, a **short-range** wireless technology
 - Operating at **13.56MHz**
 - Based on the RFID HF standard (ISO14443 & ISO15693)
- **Interactive** and **zero power**, enabling convenient connection to the Internet of Things
- ➔ **NFC-enabled mobile phone can engage with items by a simple tap**
- NFC is developed by the NFC Forum
 - **Interoperability** between devices
 - **Standardized** use cases (web link, Bluetooth handover,...)




Payment, access (Car, building...), gaming, consumables, authentication, interaction, data transfer...

www.st.com/st25r





Why NFC?

-  observable trend to **contactless interaction**
-  desire for **additional features** and **digitized experience**
-  need for **more connectivity** from customer and manufacturer

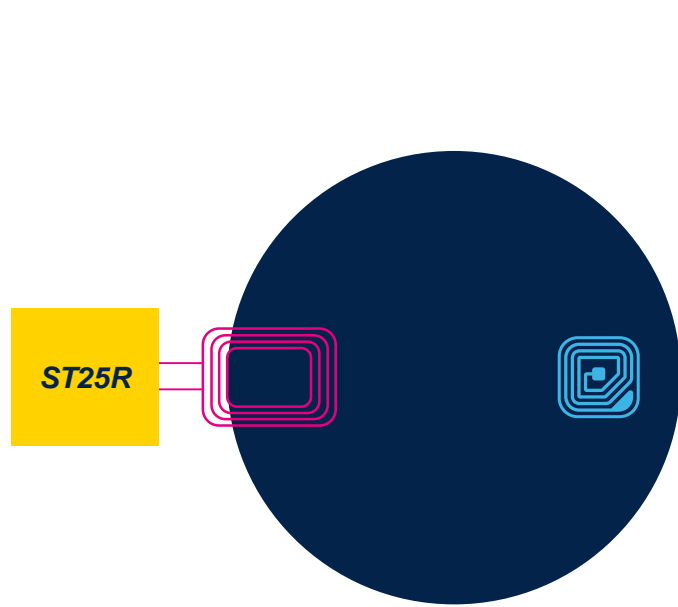




Enhance product **safety** with reader + tag

reader & tag positioning verification **improves safety** and **prevents damage**

wireless technology enables **isolated communication** in critical environments



Rotate & Lock



**Insertion
RSSI measurement**



**isolated gap
communication**

wireless communication without physical path (drillings, tubes, holes,...)

Contactless market: booming opportunities ST25 NFC tags & readers pervasion

Comprehensive portfolio :
Short range – Long range

Growing contactless markets :
> 10% CAGR 2018-2023

Complete ecosystem
to ease
adoption

Readers
ST25R



Tags
ST25T



Dynamic tags
ST25D



Best-in-class RF performance



- Lighting
- Metering
- Payment
- Transportation
- Consumer electronics
- Consumer brands
- Automotive
- Healthcare

Active member
at standards



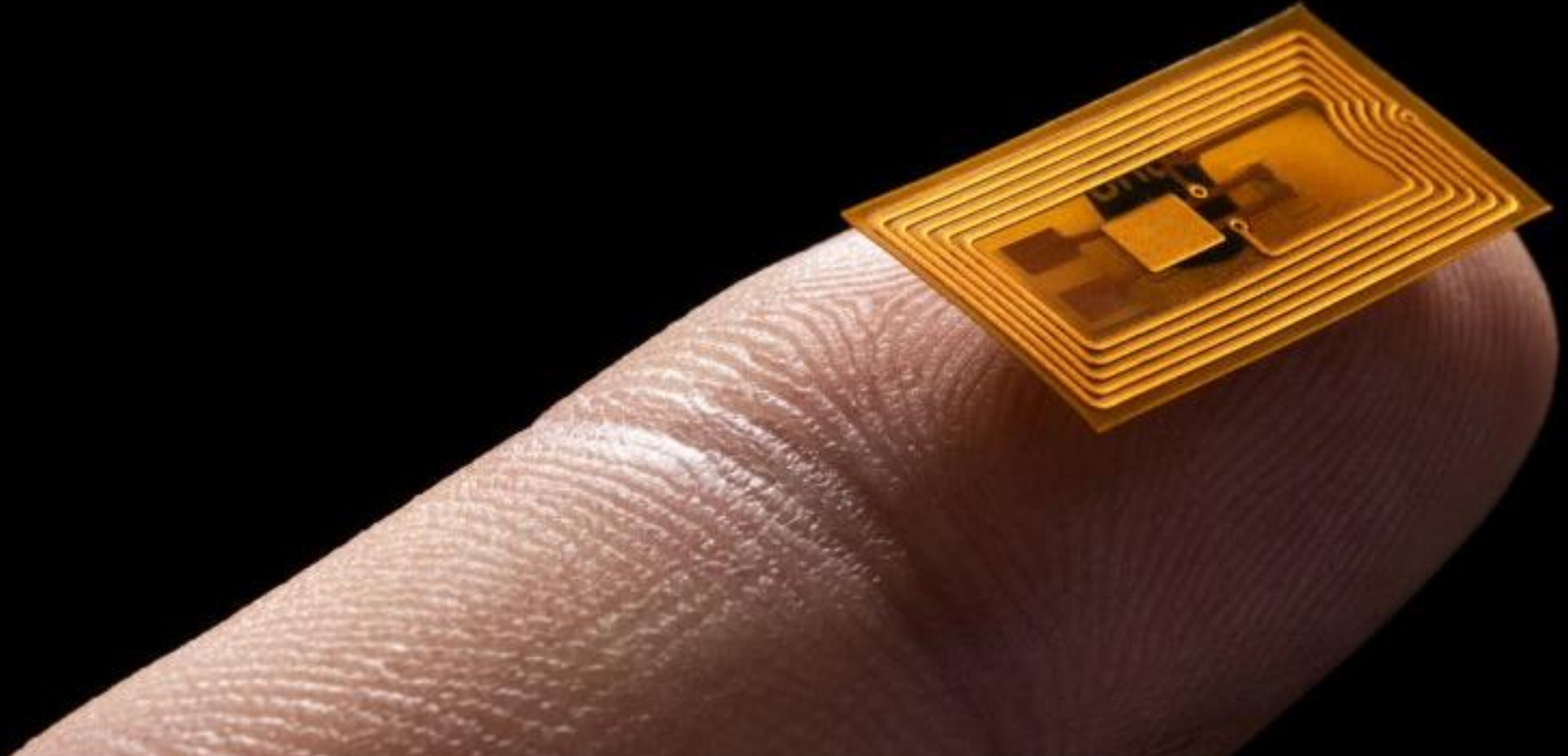
CARCONNECTIVITY
consortium®



WIRELESS POWER
CONSORTIUM



ST25 New Gen NFC Tag Chips





ST25 tag family

40 years
1M cycles

ST25 NFC tag family

Suitable application

<p>ISO 14443-A</p>	<p>ST25TA512B ST25TA02KB</p> <ul style="list-style-type: none"> NFC Forum type 4 Password + Dig signature Capacitance: 50pF 	<p>ST25TA02KB-P ST25TA02KB-D</p> <ul style="list-style-type: none"> NFC Forum Type 4 Password + Digi signature GPO: Field detect/Wake up Capacitor: 50pF 	<p>ST25TA16K ST25TA64K</p> <ul style="list-style-type: none"> NFC Forum Type 4 Password 128-bit Capacitance: 25pF 	<p>ST25TN512 ST25TN01K New</p> <ul style="list-style-type: none"> NFC Forum Type 2 (CR12) Memory up to 16640 bits Augmented NDEF TruST25 Digital Signature Capacitance: 50pF Cost-effective
<p>ISO 14443-B</p>	<p>ST25TB512-AC ST25TB02K-AC ST25TB04K-AC</p> <ul style="list-style-type: none"> ISO14443B Proprietary Resetable OTP Capacitance: 68pF 	<p>ST25TB512-AT</p> <ul style="list-style-type: none"> ISO14443B Proprietary Dedicated to transport Anti-tearing Capacitance: 68pF 		
<p>ISO 15693</p>	<p>Large Capacitance</p> <p>ST25TV512 ST25TV02K</p> <ul style="list-style-type: none"> NFC Forum Type 5 Digital Signature Untraceable & Kill modes Tamper Detect Capacitance: up to 99.7pF 	<p>Packaged Chip With Special Features</p> <p>ST25TV04K-PE</p> <ul style="list-style-type: none"> NFC Forum Type 5 Digital Signature Energy Harvesting Configurable GPO Capacitance: up to 99.7pF 	<p>High Density</p> <p>ST25TV16K ST25TV64K</p> <ul style="list-style-type: none"> NFC Forum Type 5 Digital Signature Untraceable & Kill modes Tamper Detect Capacitance: 28.5pF 	<p>ST25TV512C ST25TV02KC New</p> <ul style="list-style-type: none"> NFC Forum Type 5 (CR12) Memory up to 2560 bits Augmented NDEF TruST25 Digital Signature Untraceable mode Unique Tap Code Capacitance: up to 99pF


Product information


Asset tracking


Access control


Anti-counterfeit


Brand protection


Gaming

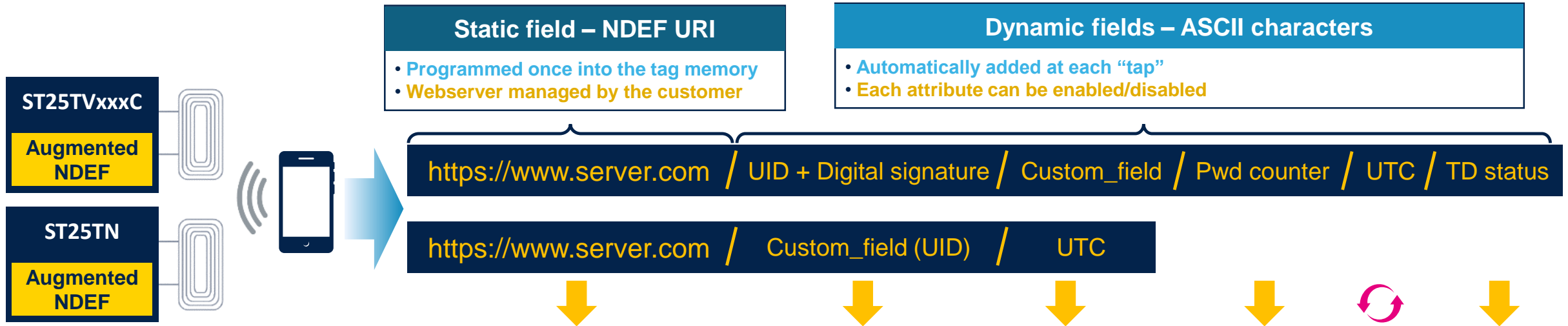

Consumer engagement


Transport

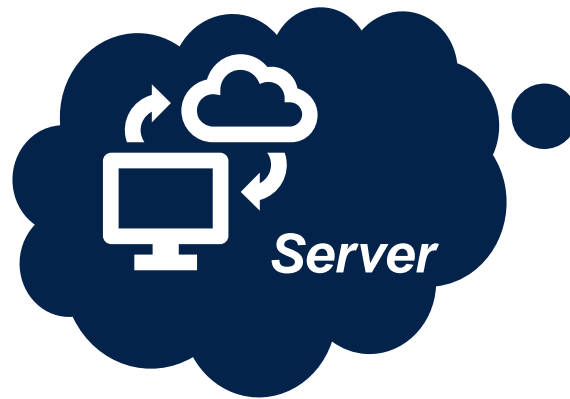
ST25T Roadmap



ST25 Augmented NDEF



- ✓ All attributes are extracted from the ANDEF link by the server and used inside the application.
- ✓ Warning can be highlighted in case of doubtful / not expected values.



! Your product seems DOUBTFUL

Tag UID E002080007AAC7CB	Tamper Status Closed
Custom Field WINE000	Tamper History SEAL: Closed
Unique Tap Code UTC: Invalid	



ST25T ANDEF demo

Webserver demo:

[https://www.myst25.com/andef/index.php?data=\[UID\]x\[CUST\]x\[UTC\]x\[TD\]](https://www.myst25.com/andef/index.php?data=[UID]x[CUST]x[UTC]x[TD])

ST25 Connect
Simply more connected

Your product seems **GOOD**

- Tag UID: E002080007AAC7CB
- Custom Field: WINE0000
- Tamper Status: Closed
- Tamper History: SEAL : Tamper closed
- Unique Tap Code: Unique Tap Code OK

ST25 Connect
Simply more connected

Your product seems **DOUBTFUL**

- Tag UID: E002080007AAC7CB
- Custom Field: WINE0000
- Tamper Status: Opened
- Tamper History: OPEN : Tamper opened
- Unique Tap Code: Unique Tap Code OK

Name



For Validation Purpose

TD0/TD1 pins disconnected

Name



For Validation Purpose

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RESELLERS

Add New Product

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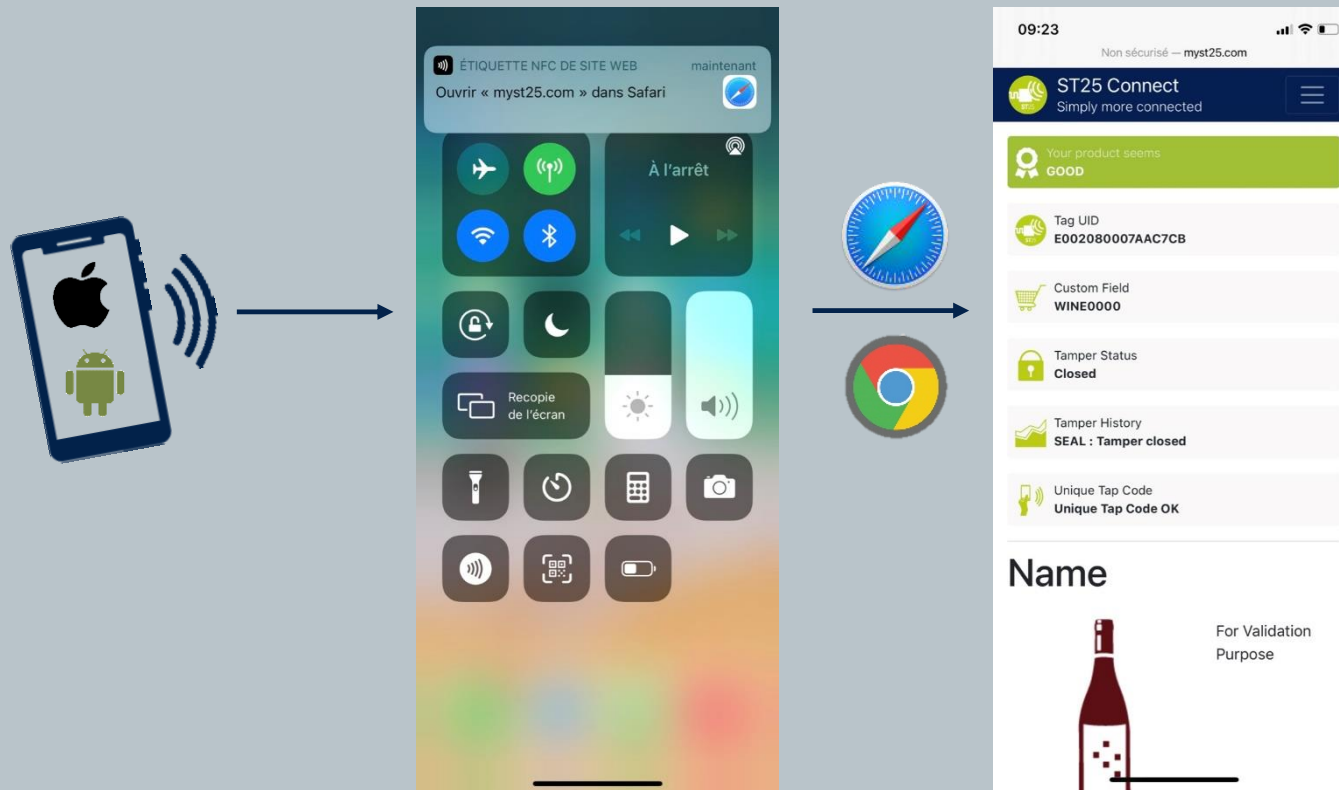
RESELLERS

Add New Product



ST25 Webserver

ST25 Webserver demo for ST25 NFC Tags

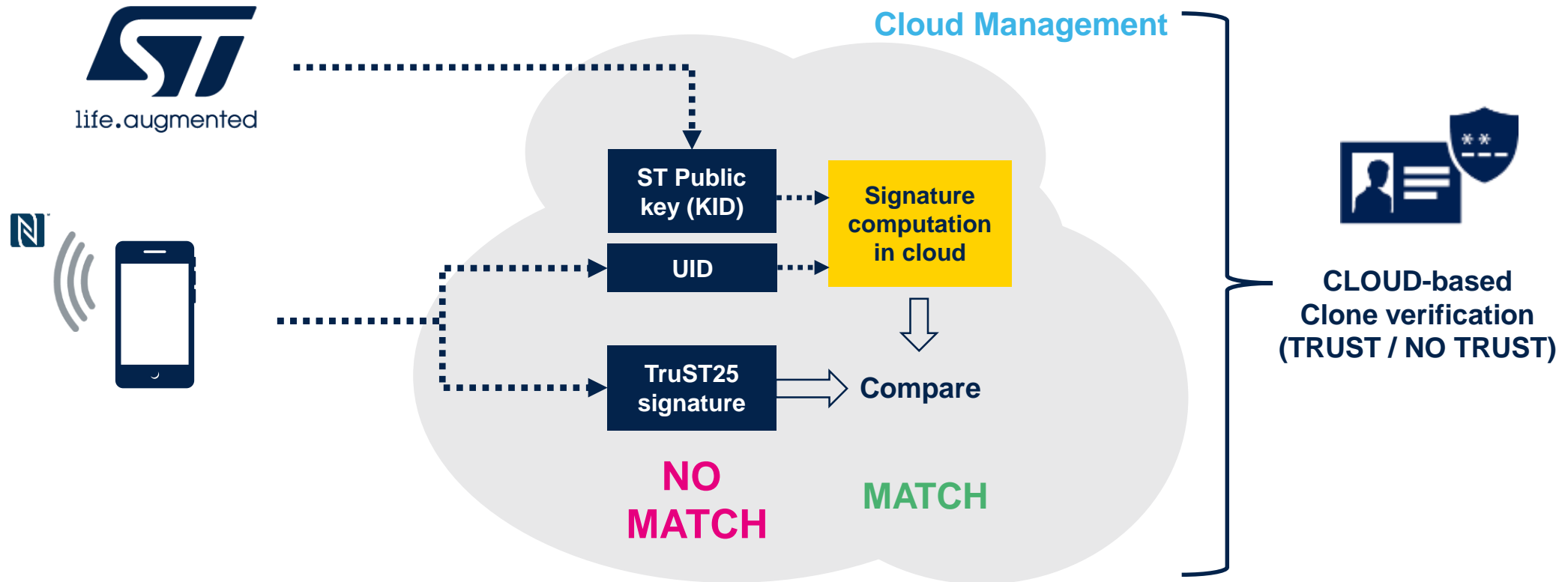


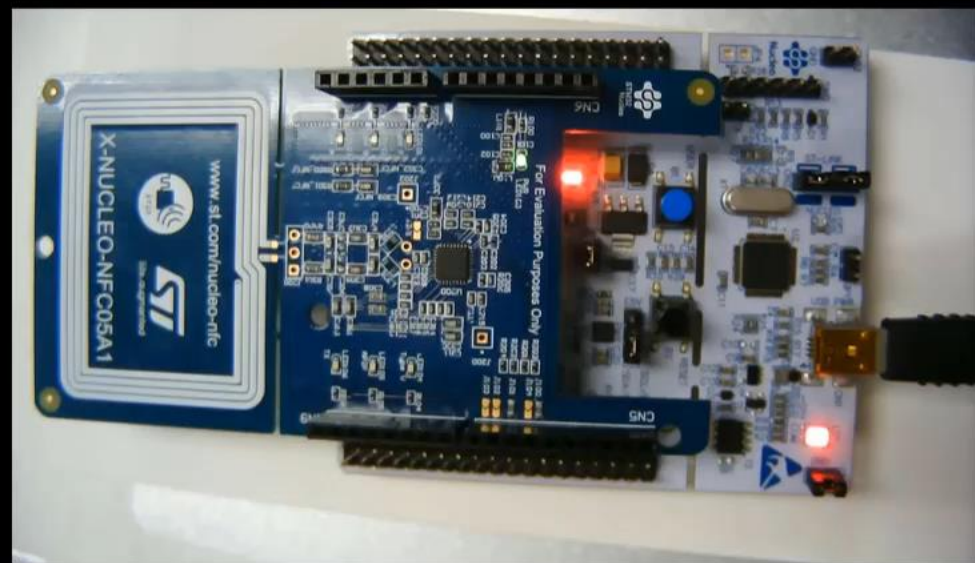
- Open-source webserver: www.myst25.com
- Compatible with ST25TV and ST25TN product series
- Augmented NDEF experience
- Native and automatic access to NDEF records
- Shared with customers on specific request and through MFT platform (SLA0085 process)
- Developed in HTML5 and PHP7.0 – Uses MySQL database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



TruST25™ digital signature overview

Chip proven authenticity services based on TruST25





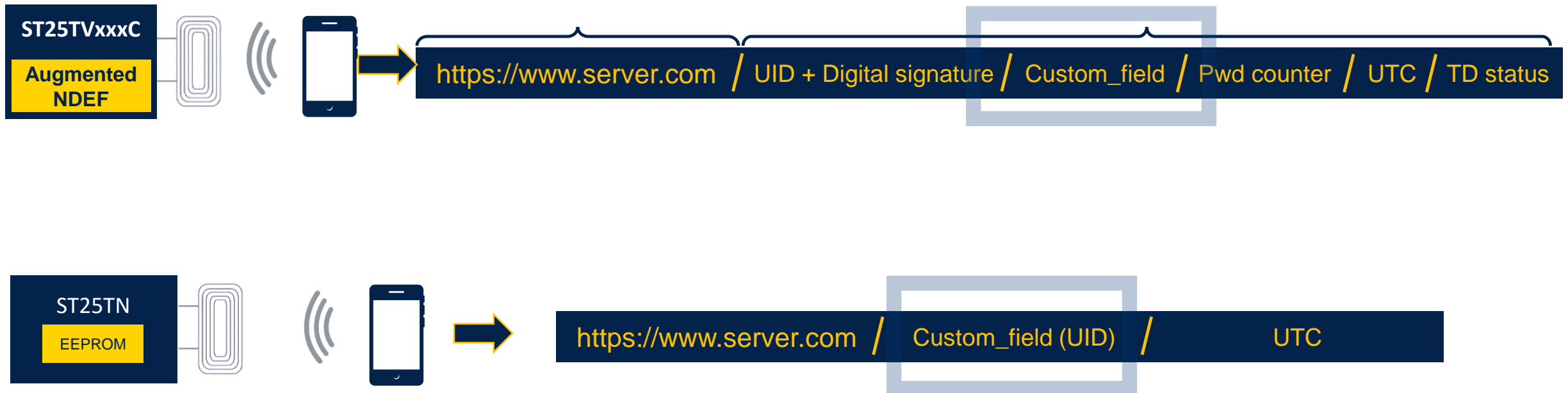
基于ST25TV标签数字签名的
防伪应用

ST25TV TruST25 digital
signature for
authentication



ST25T custom field

Augmented NDEF custom message





ST25T Unique Tap Code (UTC)

Unique code generator

- The UTC is a code generated by the tag itself at each new RF session that makes the ANDEF message (see ANDEF slide) unique and dynamic.
- The UTC is coded on 3 bytes (ASCII format) and can be enabled/disabled.
- A dedicated Application Note AN5628 provides further information about this mechanism.



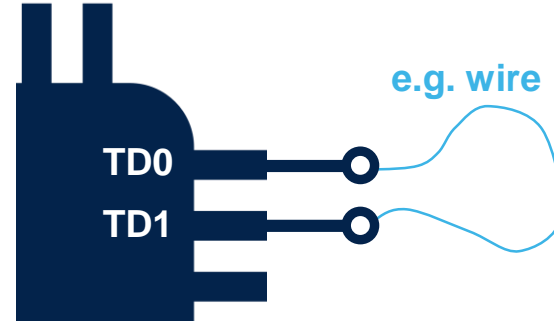
Fresh value generated once per RF session



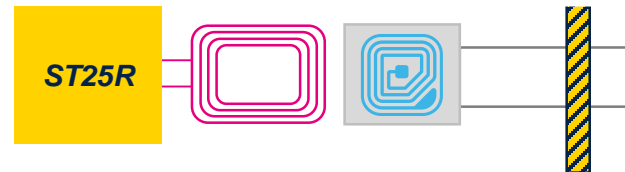


Prevent product tampering

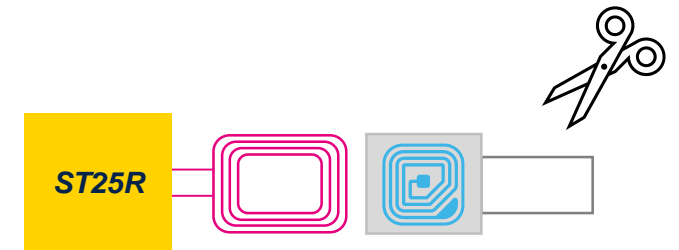
Tamper detection with ST25T tags
Detection of open/circuit on tamper pins



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



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



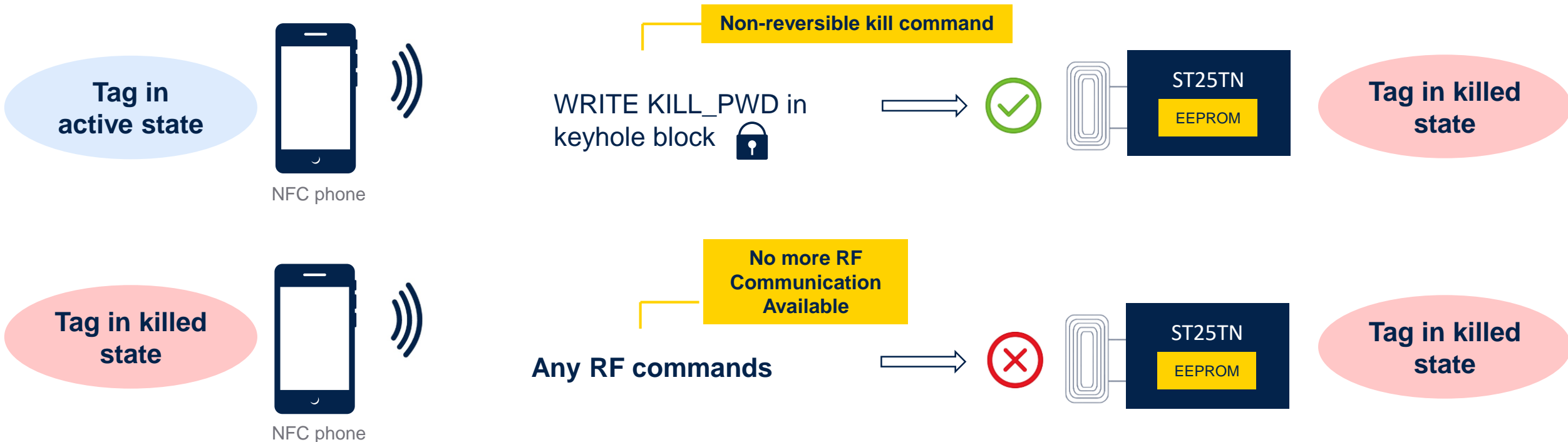
wire seal
cutting of wire or strand will
invalidate product for reuse or refill





ST25T kill mode

Kill mode : permanent deactivation of the tag



- The kill command is enabled (and is functional) only if the *kill keyhole* (block 30h) is not locked
- When kill command is disabled, the tag device cannot be killed
- The kill command may be disabled by locking the *kill keyhole*



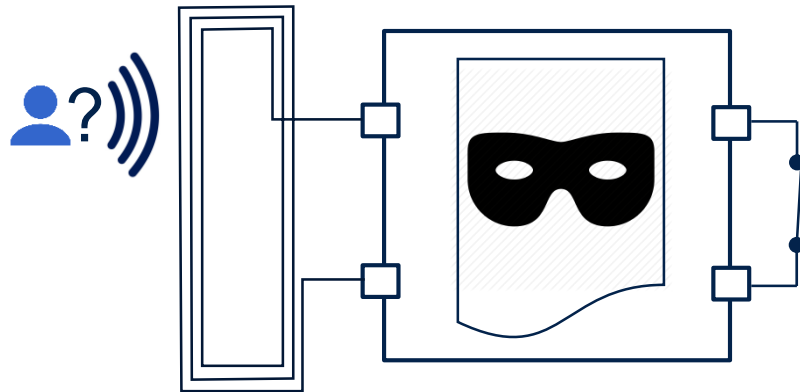
ST25T Privacy mode

Privacy protection with **untraceable + temper detection**



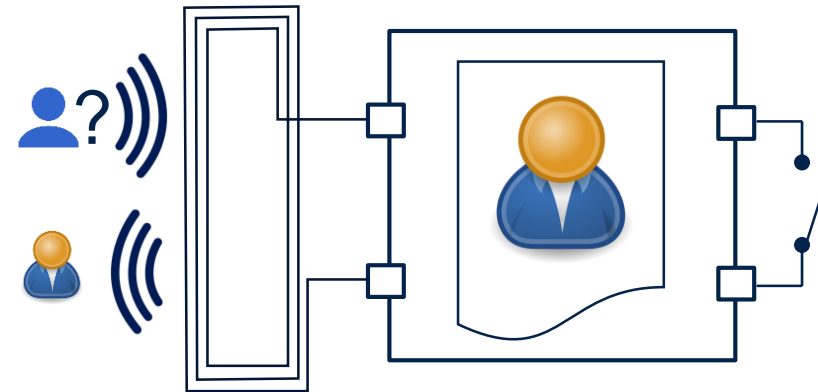
Before unsealing

- No response to standard command
- Privacy data was protected



After unsealing

- Privacy data can be read by end-users only after unsealing





ST25 产品组合 标签和读写器一站式服务

Tags			Dynamic Tags			NFC / HF Readers					UHF Readers
ST25TA	ST25TB	ST25TV	M24SR	ST25DV-I2C	ST25DV-PWM	ST25R95 *	ST25R3911B ST25R3912	ST25R3914 ST25R3915	ST25R3916 ST25R3917	ST25R3920	ST25RU3993
ISO14443-A 106kbps NFC Type 4	ISO14443-B 106Kbps	ISO15693 up to 53Kbps NFC Type 5	ISO14443-A 106kbps NFC Type 4	ISO15693 up to 53kbps NFC Type 5	ISO15693 up to 53kbps NFC Type 5	ISO14443-A/B ISO15693	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO18000 6c & b Gen2 Protocol
EEPROM 512b-64Kb 200-year retention 1M cycles	EEPROM 512b-04Kb 40-year retention 1M cycles	EEPROM 512b-64Kb 200-year retention 1M 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	Reader/Writer Card Emulation	Reader/Writer P2P EMVco & PBOC	Reader/Writer P2P AEC-Q100	Reader/Writer P2P Card Emulation EMVco & PBOC	Reader/Writer P2P Card Emulation AEC-Q100	Reader / Writer -90dBm sensitivity Internal VCO
TruST25 128b password 20b counter UID RF Detect	32b counter Lock OTP bits UID	TruST25 64b password 16b counter UID Tamper Detect	128b password RF disable RF Detect UID	Fast X-fer Mode 64b password E-Harvesting RF Detect UID	TruST25 64b password UID		VHBR AAT, DPO Multi-antenna	AAT, DPO Multi-antenna	AWS, AAT, DPO Multi-antenna	AWS, AAT, DPO Multi-antenna	Dense Reader Mode Linear RSSI Automatic PSRR Auto ACK
			I2C 1MHz 2.4V-5.5V	I2C 1MHz 1.8V-5.5V	2x PWM 488-31.25 kHz 1.8V-5.5V	SPI & UART 2Mbps 2.7V-5.5V 230mW	SPI 6Mbps 2.4V-5.5V 1W – 1.4W	SPI 6Mbps 2.4V-5.5V 1W	SPI 10Mbps I2C 3.4Mbps 2.4V-5.5V 1.6W	SPI 5Mbps I2C 3.4Mbps 2.4V-5.5V 1.6W	SPI 10Mbps 1.65V-5.5V 0-20dBm
SBN12 / SBN075 / FPN5	SBN12	SBN12 / SBN075 / FPN5	SO8 / TSSOP8 / FPN8 / SBN12	SO8 / TSSOP8 / FPN8 / FPN12 / WLCSP10 / SBN12	SO8 / TSSOP8	32-pin QFN	WF 32-pin QFN / 32-pin QFN / WLCSP-30 / Wafer	WF 32-pin QFN / 32-pin QFN	WF 32-pin QFN / WLCSP-36	WF 32-pin QFN	48-pin QFN

*: same as former CR95HF / ST95HF

ST25Connect Program



ST25 Connect

ST25Connect Program

- Webpage alive
https://www.st.com/content/st_com/en/campaigns/st25-connect.html
- Objective : direct promotion at brands
- Dedicated content by vertical

Resources

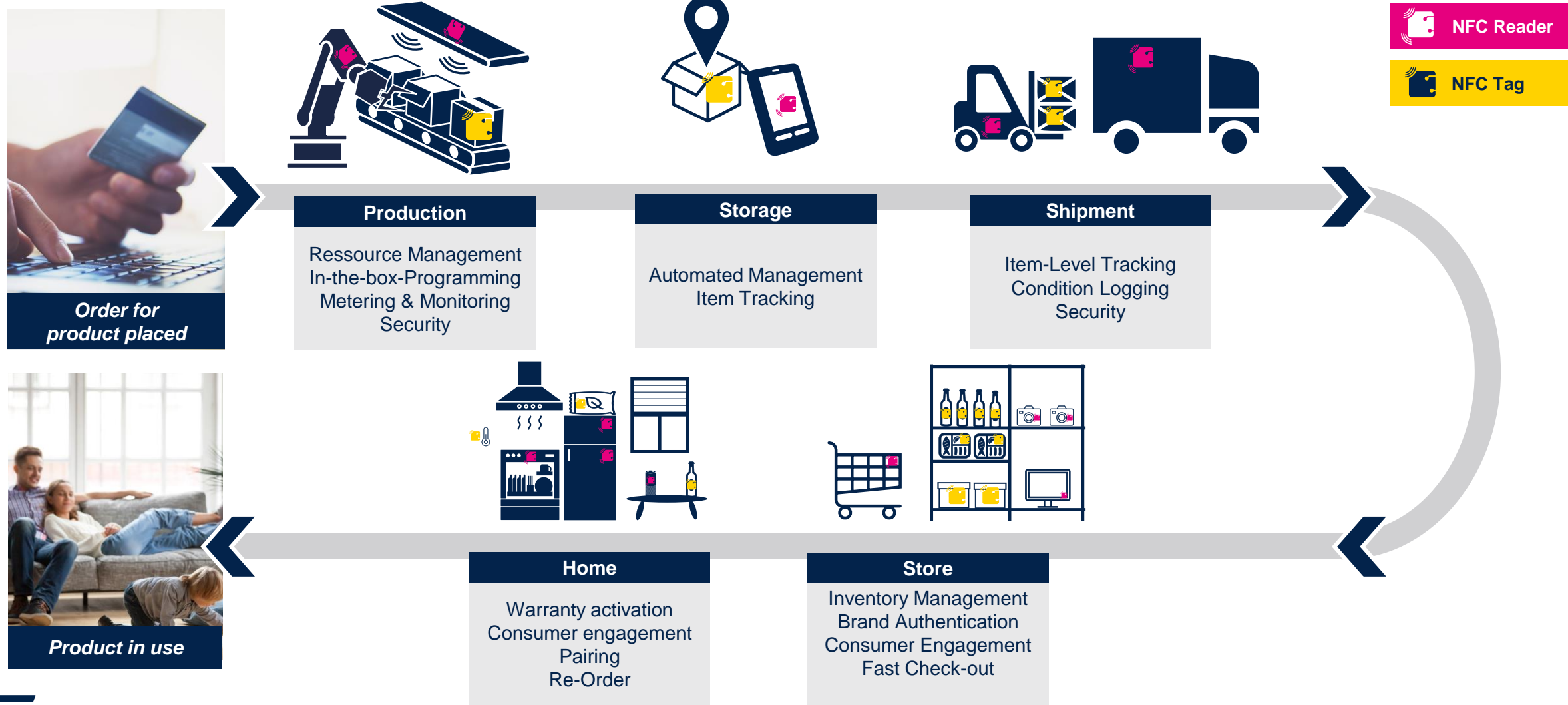


- Call to Action
 - Customer request → st25connect@st.com
- Network of trusted partners
- Ensure the best product integration and implementation of NFC technologies.





Product life cycle with NFC



Our technology starts with You



Find out more at www.st.com

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