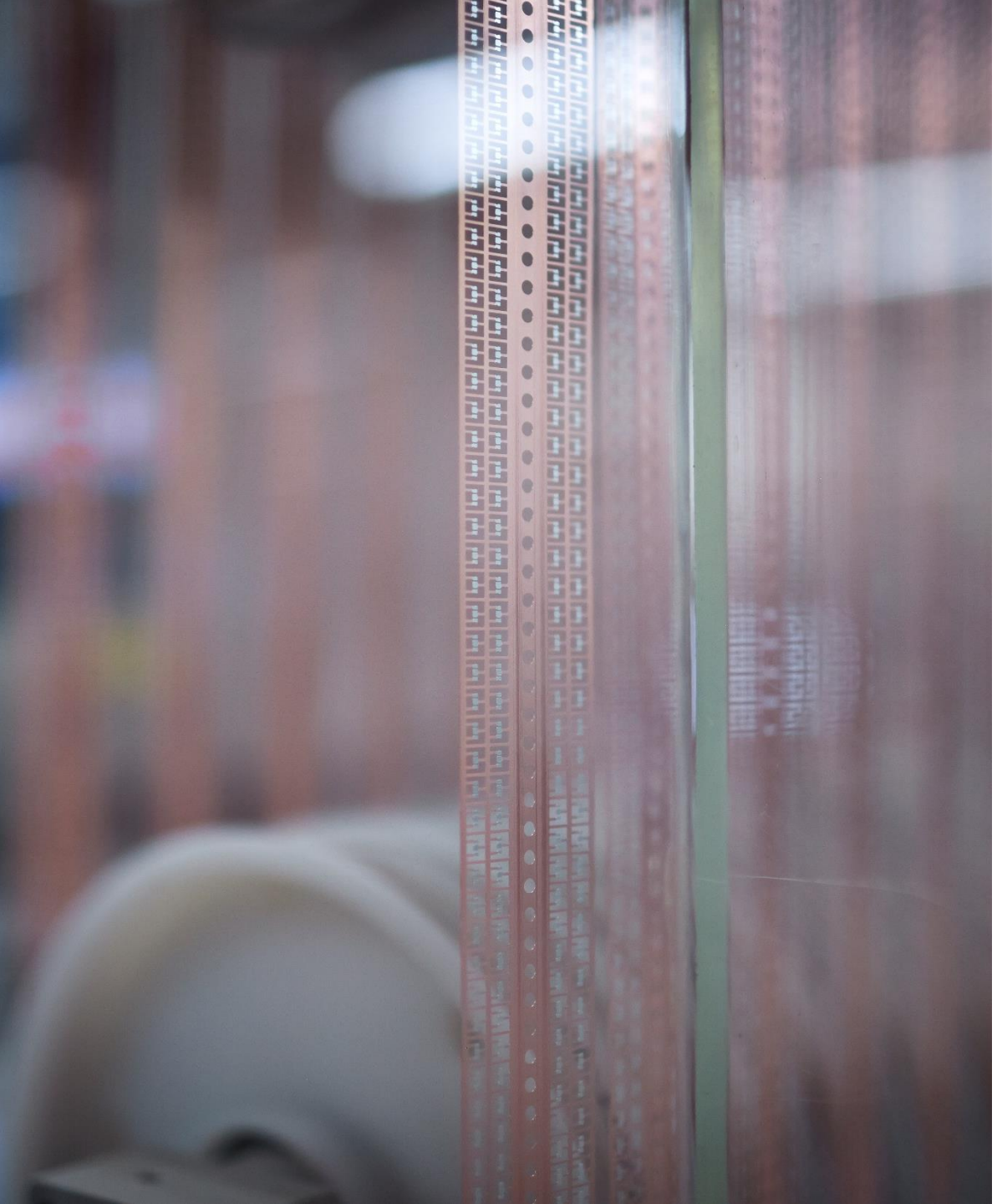
LEARN ALL ABOUT NFC

SESSION 1: NFC APPLICATIONS AND USE CASES

JORDI JOFRE
NFC EVERYWHERE
MARCH 2018

PUBLIC

SECURE CONNECTIONS
FOR A SMARTER WORLD



Learn all about NFC

Session I, 15th March
NFC applications and use cases
https://attendee.gotowebinar.com/rt/1059402932312036099

Session II, 22th March
NFC essentials
https://attendee.gotowebinar.com/rt/6461366231742998273

Session III, 28th March
NFC product portfolio
https://attendee.gotowebinar.com/rt/8452313508808186113

Session IV, 12th April
Product support package
https://attendee.gotowebinar.com/rt/3965453945970616321

NFC everywhere

The evolution of NFC

2002

NXP and **Sony** co-invent NFC technology

2004

NXP co-founds the **NFC Forum** to lead collaborations with industry stakeholders and help standardize the technology

2006

Nokia 6131: Nokia launches the first NFC phone

2009

NFC Forum releases **Peer-to-Peer** standards

2010

Nexus S: Google launches the first Android NFC phone

2014

Apple introduces iPhone 6 with **Apple Pay** using NFC technology

2015

- NXP ships the **1Bth chip** to enable **secure NFC transactions** in smartphones
- NXP wins prestigious **European Inventor Award** for NFC

2016

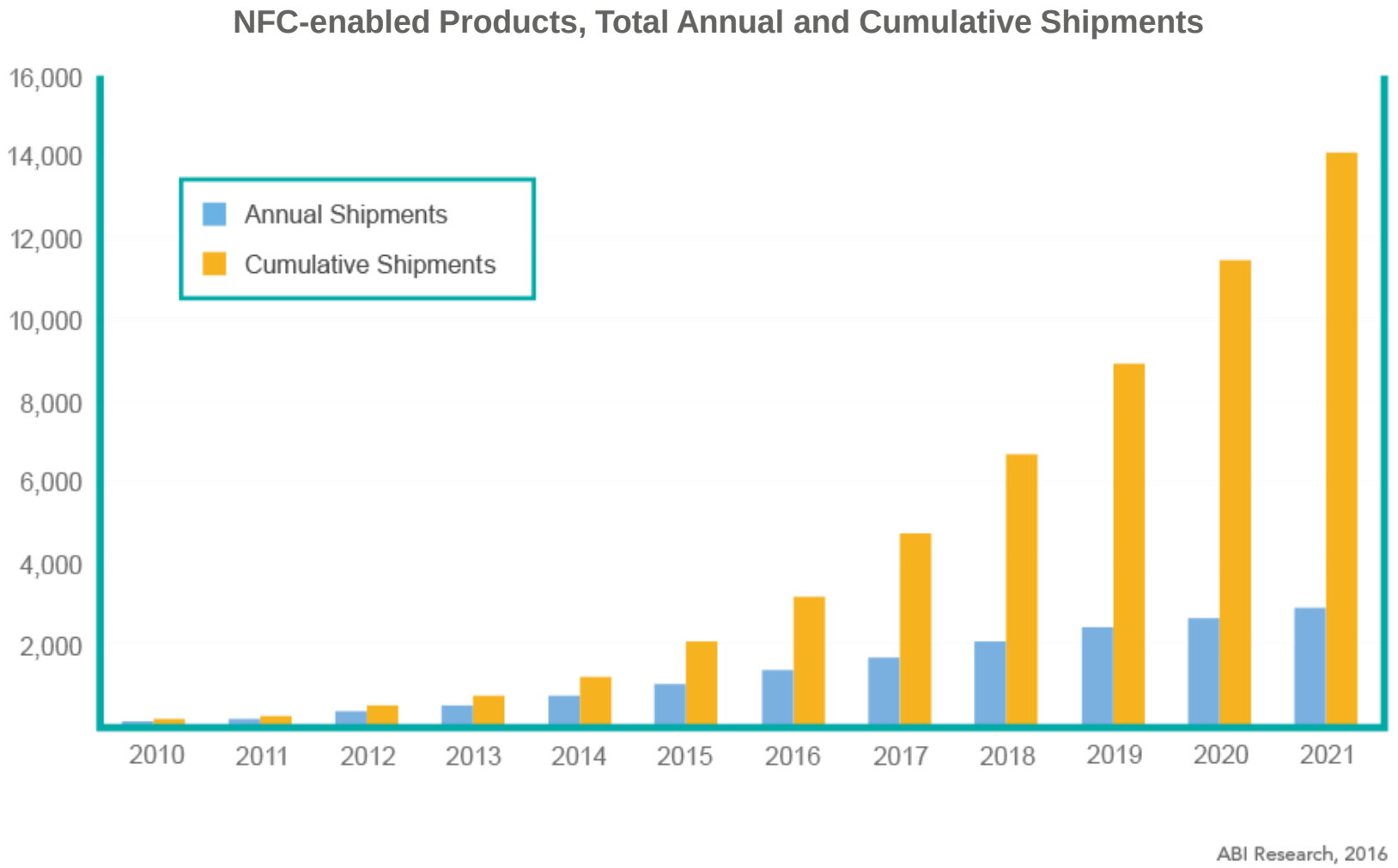
- Apple introduces **iPhone 7** that supports reading **Felica cards** (NFC Forum Type 3 tag) in Japan [link here]
- **Apple** is officially **chairing the IoT working group** at the NFC Forum [link here]

2017

- **Apple** implemented NFC tag reading functionality in iOS 11
- NFC Forum IoT working group introduced **NFC tag certification** ensuring predictable customer experience

Training Mobile Knowledge

NFC in numbers



ABI Research, 2016

2 billion

NFC-enabled devices

will be deployed in 2018

Training Mobile Knowledge

In many ways, NFC is NXP

We co-invented the technology

- Co-invented NFC in 2002 together with Sony
- Co-founded the NFC Forum with >170 member companies today

Nobody ships more NFC ICs

- 80% of all NFC-enabled point-of-sales (POS) terminals by NXP
- 80% of all NFC-enabled smartphones by NXP

Nobody gives you more ways to succeed

- Broadest NFC portfolio in the industry
- Commitment to performance, power savings, and security

NFC can be used in multiple applications

ACCESS CONTROL

PARAMETERIZATION AND DIAGNOSIS

AUTHENTICATION AND IDENTIFICATION

PAIRING AND COMMISSIONING

PAYMENT

DEVICE-TO-DEVICE COMMUNICATION

NFC for access control

NFC for machinery access rights

Use cases

- Tap-and-authenticate to machines.
- Restrict logical access to specialized machinery to only trained or skilled employees.

Benefits

- Set up individual profiles, personalize settings and adjust preferences.
- Varying levels of authorized access.
- Increase productivity with faster access to specialized machinery.

NFC solutions

- NFC frontends: **CLRC663 *plus***.
- NFC controller: **PN7462**, **PN736x**.
- Contactless card/token: **MIFARE® DESFire® EV2 contactless IC, MIFARE Plus® EV1 contactless IC.**

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NFC for electronic meeting rooms sign in

Use cases

- Check into meeting room with NFC badge
- Delete meetings or modify them with NFC badge or pin code as identification
- Automatically release meeting room in case of no-show

Benefits

- Time & attendance logging.
- Time-limited access for temporary personal.
- Reduce maintenance and replacement costs, with fewer lost or damaged keys, cards or badges.

NFC solutions

- NFC frontends: **CLRC663 *plus***.
- NFC controller: **PN7462**, **PN736x**.
- Contactless card/token: **MIFARE DESFire EV2, MIFARE Plus EV1.**

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NFC for fare collection

Use cases

- Getting access to public transportation and city services via NFC.

Benefits

- Higher security compared with legacy technology.
- Easier tracking of user behavior/fraud detection.
- Increased user convenience and commercial speed.
- Reduced maintenance costs.

NFC solutions

- NFC frontends: **CLRC663 *plus***.
- NFC controller: **PN7462**, **PN736x**.
- Contactless card/token: **MIFARE DESFire EV2, MIFARE Plus EV1, MIFARE Ultralight® contactless IC family.**

NFC for smart locks

Use cases

- Flexible access management to homes and apartments
- Flexible management of access rights enabling in-home delivery, home care, home sharing

Benefits

- Dynamic management of access rights
- Higher security compared to legacy technology
- Easy integration of passive and active form factors
- Easier tracking of user behavior/fraud detection
- Reduced maintenance costs

NFC solutions

- NFC frontends: **CLRC663 *plus***.
- NFC controller: **PN7462**, **PN736x**.
- Contactless card/token: **MIFARE DESFire EV2,**

NFC for parameterization and diagnosis

NFC for relays, timers and dimmers configuration

Use cases

- NFC enables (zero-power) parameterization and diagnosis
- NFC smart phone is used as an extended user interface
- Makes configuration easier and more accurate

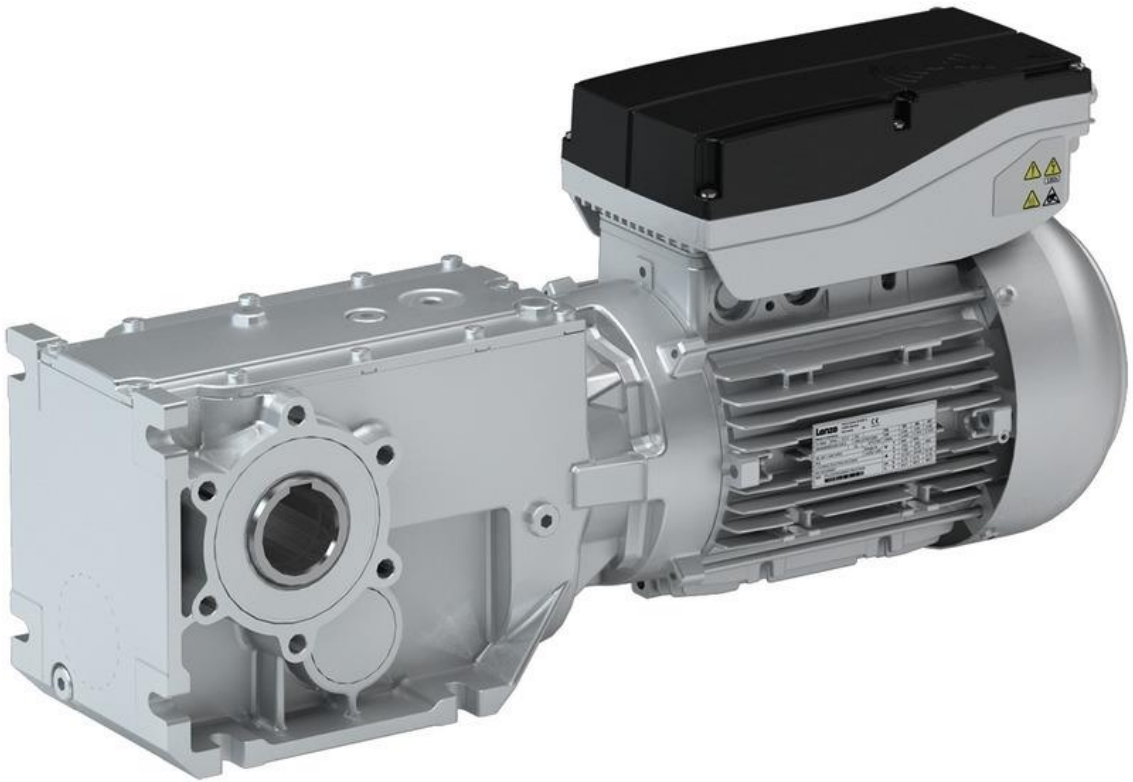
Benefits

- Handle complex device settings easily on the phone/tablet touchscreen.
- Better accuracy adjustments than mechanical controls.
- Zero-power operation, the device can be unpowered.
- Reduce bill of materials (no button or LCDs)

NFC solutions

- NFC connected tags: **NTAG I²C *plus***.

NFC for motor control



Use cases

- NFC smart phone programmability to drive parameter settings.
- NFC enables configurable speed and configurable soft starter behavior

Benefits

- Makes configuration easier and more accurate
- Reduces the number of different drive versions by up to 70%

NFC solutions

- NFC connected tags: **NTAG I²C *plus***.

Copyright ©2017 Lenze Smart Motor

NFC for sensors and switches

Use cases

- NFC enables (zero-power) parameterization and diagnosis
- Configure start-up behavior
- Read out current status, interpret error codes
- Easy access to user manual on the phone

Benefits

- Better accuracy adjustments than mechanical controls.
- Communicate with battery-less or unpowered devices.
- Simplified human interface (no complex user manuals)
- Update firmware version wirelessly without dismounting the device.

NFC solutions

- NFC connected tags: **NTAG I²C *plus***.

Copyright ©2016 PyroNFC

NFC for sport bike computer

Use cases

- Use your NFC smart phone as an external user interface to easily adjust all the settings of your bike computer
- Collect and track your activities in the smart phone app

Benefits

- Makes configuration easier and more accurate
- Use a phone as external user interface to read your training data.
- Use the phone screen to display training statistics.

NFC solutions

- NFC connected tags: **NTAG I²C *plus***.

Copyright ©2016 Sigma

NFC for authentication and identification

NFC for consumable authentication

Use cases

- Authenticate accessories or parts.
- Easy re-ordering of consumables by simply tapping it with the NFC phone

Benefits

- Combat counterfeits by authenticating accessories
- Brand protection
- Channel authentication against grey markets

NFC solutions

- NFC frontends: **MFRC630, SLRC610**.
- NFC tag: **NTAG21x, NTAG Tag Tamper, NTAG DNA, ICODE SLIX2, ICODE DNA**

Copyright ©2017 Vitamix

NFC for accessories

Use cases

- The NFC Tag antenna checks if the lid is properly closed before the blender starts.
- Blender characteristics change depending on the attachment

Benefits

- Combat counterfeits by authenticating accessories
- Brand protection
- Channel authentication against grey markets

NFC solutions

- NFC frontends: **MFRC630, SLRC610**.
- NFC tag: **NTAG21x, NTAG Tag Tamper, NTAG DNA, ICODE SLIX2, ICODE DNA**

NFC for toy portals and figurines

Use cases

- NFC allows the user to transfer characteristics of figurines into the virtual world of the console game.
- Toys can interact with other toys, video game accessories, bridging physical and virtual worlds

Benefits

- Enjoy the connection between the real and virtual world
- Toys keep scores/credentials
- Physical toys trigger events in virtual world
- New revenue streams for gaming industry

NFC solutions

- NFC frontends: **MFRC630, SLRC610**.
- NFC tag: **NTAG21x, NTAG Tag Tamper, NTAG DNA, ICODE SLIX2, ICODE DNA**

NFC for blood glucose meter

Use cases

- The glucose meter reads from the NFC label on the cartridge: expiration date, number of shots left, authenticity, …
- Additional calibration data stored on the NFC tag can help to improve the measurement accuracy

Benefits

- Minimize risk of errors
- Convenient and time efficient
- Control of proper dose is given

NFC solutions

- NFC frontends: **MFRC630, SLRC610**.
- NFC tag: **NTAG21x, NTAG Tag Tamper, NTAG DNA, ICODE SLIX2, ICODE DNA**

NFC for pairing and commissioning

NFC for Bluetooth headsets

Use cases

- NFC allows the user to easily and quickly set up a Bluetooth connection with a simple tap

Benefits

- Faster, simpler connections – no need for sub-menus or searching through lists to find devices
- No conflicts – pair only the devices you want to pair
- Secure exchanges – share credentials securely with just a tap
- Easier disconnects – tap twice to unpair
- Save power – use NFC to enable / disable sleep mode from a battery-driven BT device

NFC solutions

- NFC connected tags: **NTAG I²C *plus***.

NFC for commissioning of wireless IoT nodes

Use cases

- Tap the NFC node to the gateway to automatically add the node to the home network.

Benefits

- Shorter installation time, reduced customer support
- Secure credential exchange
- Covering any smart network protocol (NFC as trigger)
- No manual entry

NFC solutions

- NFC connected tags: **NTAG I²C *plus*** (nodes).
- NFC controller: **PN7150** (IoT gateway)

Bluetooth SMART WiFi ZigBee THREAD

NXP

Copyright ©2016 Richsound Research

NFC for Wi-Fi pairing with routers

Use cases

- Easy Wi-Fi pairing between NFC phone and the Wi-Fi router / gateway through NFC

Benefits

- A single tap with your phone to the gateway is all that‘s needed – no SSIDs to select, no passwords to enter
- Faster, simpler connections – no need for sub-menus or searching through lists to find devices
- Secure exchanges – share credentials securely with just a tap
- Easier disconnects – tap twice to unpair

NFC solutions

- NFC controller: **PN7150**

Copyright ©2016 FreFlow

NFC for event light system

Use cases

- NFC enables the configuration and connection of light devices to an electronic control unit.
- Synchronized light effects triggered by your music

Benefits

- Faster device pairing; avoid manual settings, cumbersome button combinations or entering long codes.
- Make devices easier to use and reduce tech-support costs.
- Exchange credentials securely, just by tapping.
- Use NFC to pair any wireless networking standard.

NFC solutions

- NFC frontends: **MFRC630, SLRC610**.
- NFC tag: **NTAG21x, NTAG Tag Tamper, NTAG DNA, ICODE SLIX2, ICODE DNA**

NFC for payment

NFC for secure payment

Use cases

- Pay for goods or services with a single tap
- NFC allows contactless and secure payment transactions

Benefits

- Easier and more convenient (no PIN <20€)
- Cash elimination
- Increased customer engagement

NFC solutions

- NFC frontends: **CLRC663 *plus*, PN5180**.
- NFC controllers: **PN7462**

NFC for micropayment / loyalty

Use cases

- NFC allows contactless and secure loyalty programs and micropayment solutions
- Secure and easy transactions with multi-application for micropayment and smart loyalty scheme

Benefits

- Easier and more convenient (no PIN <20€)
- Cash elimination
- Increased customer engagement

NFC solutions

- NFC frontends: **CLRC663 *plus*, PN5180**.
- NFC controllers: **PN7462**
- Contactless card/token: **MIFARE DESFire EV2, MIFARE Plus EV1**

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NFC for pre-paid e-Meter

Use cases

- Transferring credentials from the payment cards/NFC phone to the meter in order to allow access to a certain amount of energy
- Management of different tariff schemes; it can send usage statistics back to the grid via smartcard or phone

Benefits

- Post-deployment service and maintenance
- Cash elimination
- Customized access
- Low-cost payment solutions

NFC solutions

- NFC frontends: **MFRC630**.
- NFC controllers: **PN7362**
- Contactless card/token: **MIFARE DESFire EV2, MIFARE Plus EV1**

Device-to-device communication

NFC for communication with fully sealed sensors

Use cases

- Exchange / read data with battery-less sensors where no physical connection is possible (hermetically sealed galvanic isolated sensor).

Benefits

- Sensors do not require a battery since they utilize energy harvesting from the RF field
- Communication with sensors which can not be connected through wires to the main unit
- Friction-less interactions between components
- Cost savings on device-to-device interaction

NFC solutions

- NFC frontends: **MFRC630** (Main part)
- Contactless card/token: **NTAG I²C *plus*** (Attachment / moving part)

More about NFC

Find out more about NFC

- Discover NFC Everywhere: https://www.nxp.com/nfc
- Get your technical NFC questions answered: https://community.nxp.com/community/identification-security/nfc
- List of Approved Engineering Consultants (AEC) for NFC: https://nxp.surl.ms/NFC_AEC
- NFC Everywhere Brochure: https://www.nxp.com/docs/en/brochure/NFC-EVERYWHERE-BR.pdf

NFC applications and use cases

Thank you for your kind attention!

Please remember to fill out our **evaluation survey** (pop-up)

Check your email for **material download** and on-demand **video** addresses

Please check NXP and MobileKnowledge websites for **upcoming webinars** and **training sessions**

http://www.nxp.com/support/classroom-training-events:CLASSROOM-TRAINING-EVENTS

www.themobileknowledge.com/content/knowledge-catalog-0

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