Trends in der Forschung für kontaktlose Anwendungen

8. Dresdner RFID Symposium
4. – 5. 12. 2014; Dresden, Deutschland

Holger Bock, Infineon Technologies Austria AG

Überblick

- Einleitung
- CATRENE-Projekt „NewP@ss“
- IKT-Projekt „HINT“ im 7. Rahmenprogramm
- IKT-Projekt „MATTHEW“ im 7. Rahmenprogramm
- Zusammenfassung

Einleitung

- „Klassische“ RFID-Applikationen
  - Logistik
  - Transport
  - Ticketing
  - ...
- Erweiterte Anwendungsfelder
  - kontaktloses Bezahlen
  - elektronische Pässe und ID-Karten
- Trends aus den Anwendungsfeldern
  - VHBR
  - Authentizitätsanker
  - Aktive Rückmodulation

EU Public Funding Project MATTHEW

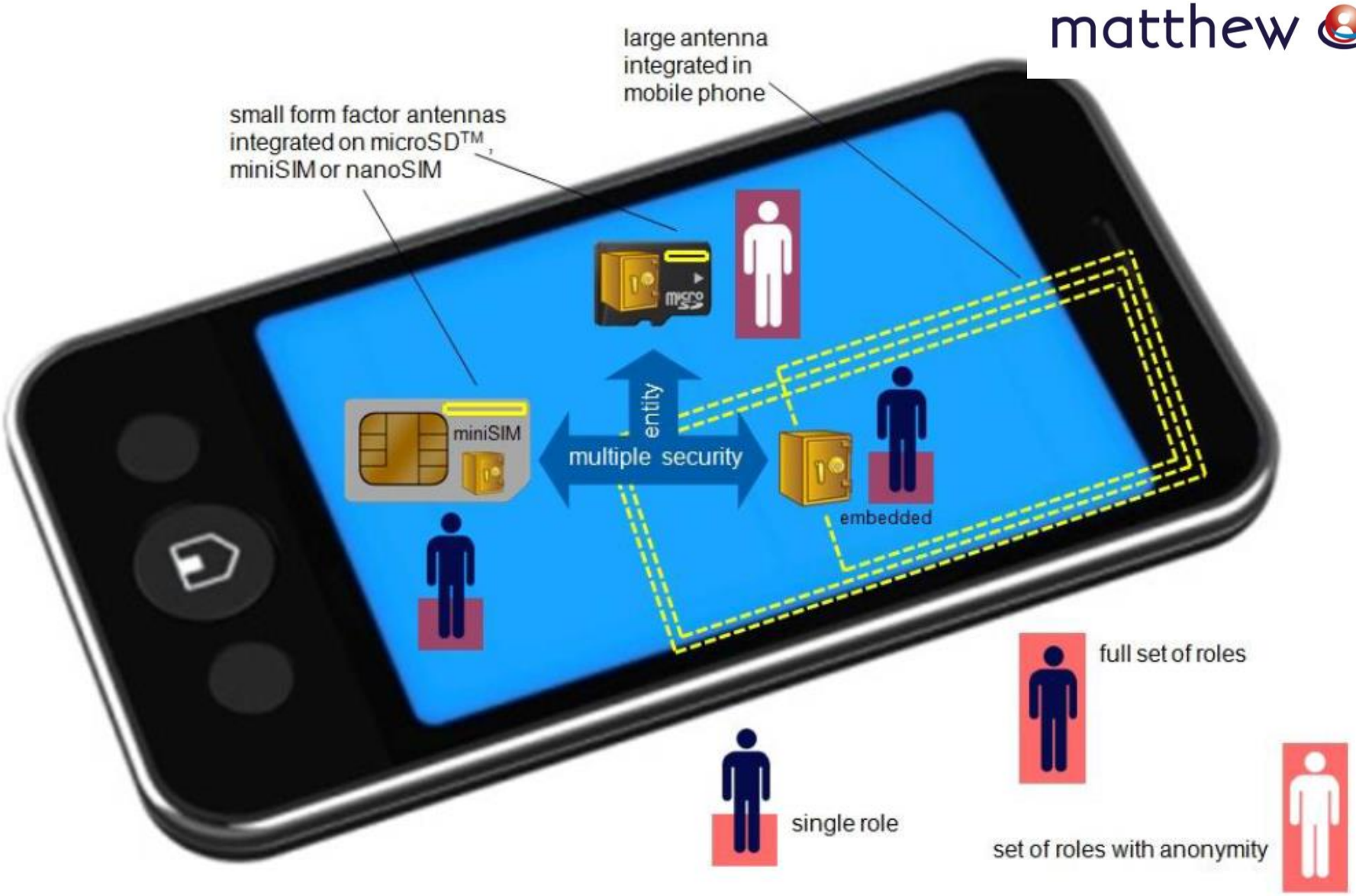
matthew

SEVENTH FRAMEWORK PROGRAMME

THEME [ICT-2011.1.4]
[Trustworthy ICT]

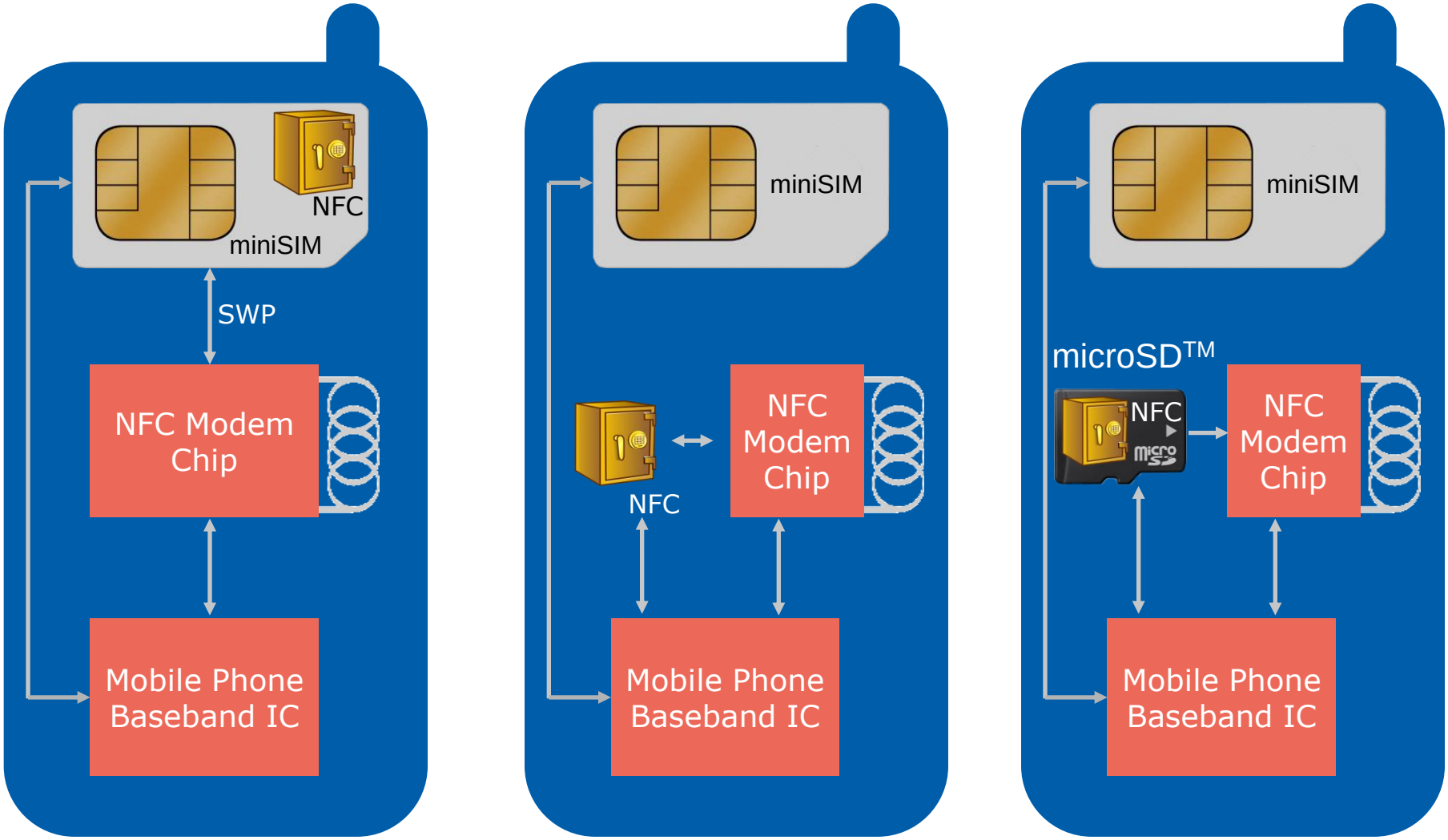
- European Commission public funding project under FP7;
- Project Start **CY 2013**, 3 years run time;
- **8 Parties** from **4 EU Member States**;
- International Coordinator: Infineon Technologies Austria;
  Scientific Leader: Crypoexperts, France;
- Target: **Multi-entity-security using active Transmission Technology**;
  active modulation, privacy-preserving transfer of credentials;

Mehrere Sicherheitsanker in einer mobilen Plattform



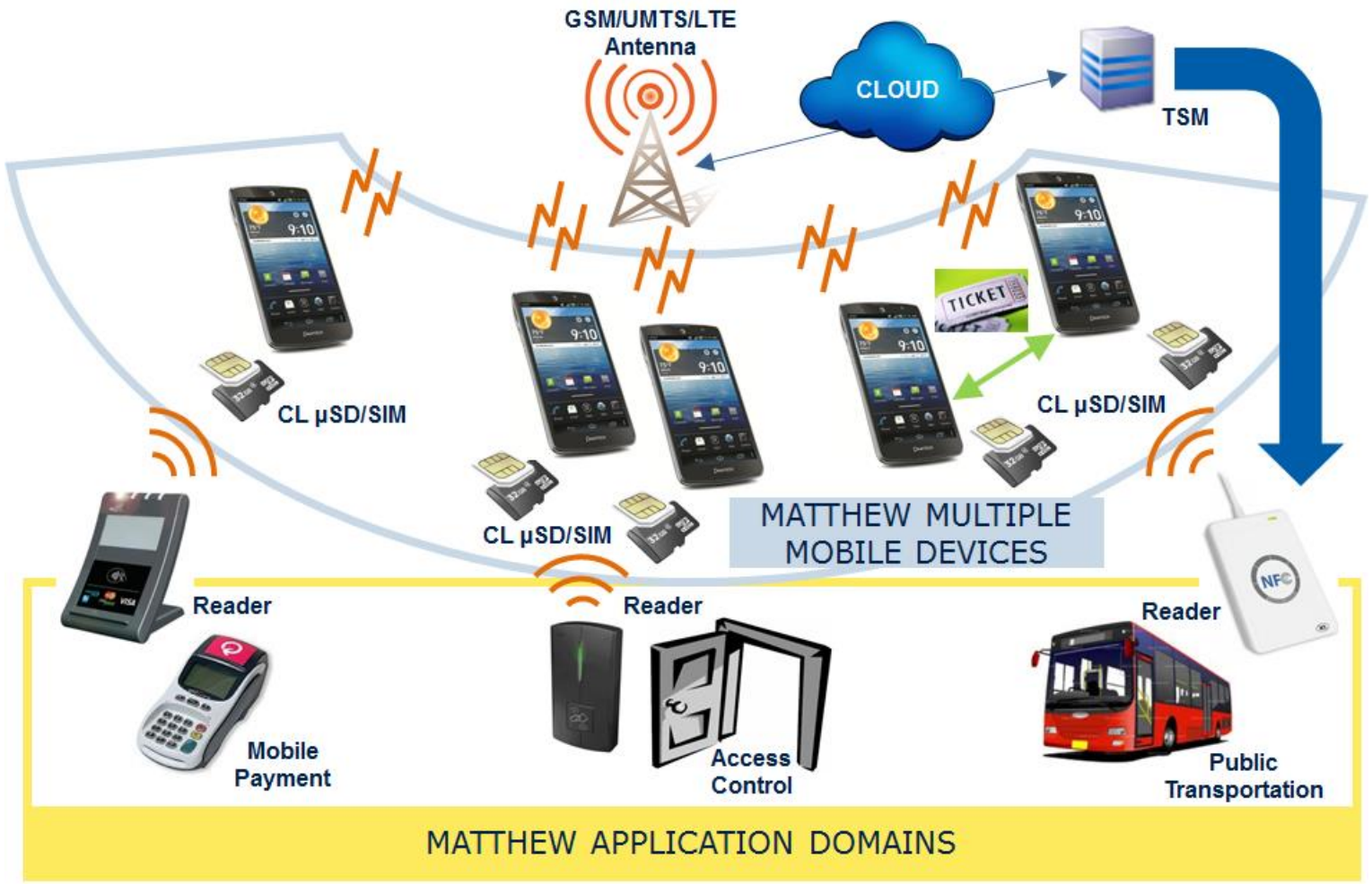
Bisherige NFC Implementierungen

matthew



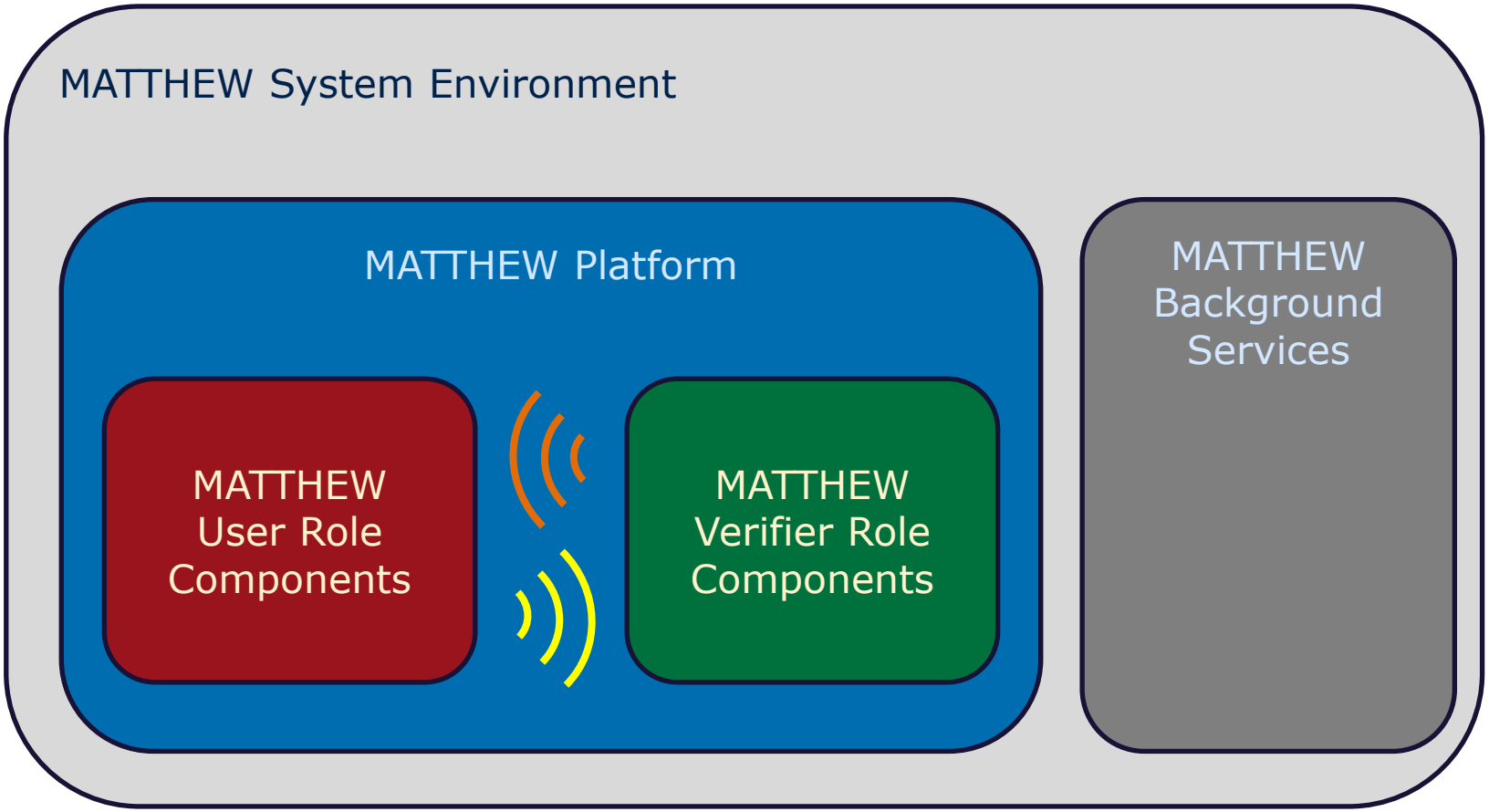
Mobile Network Operator (MNO) OEMs, Google Wallet Banks

Anwendungsszenarien in MATTHEW



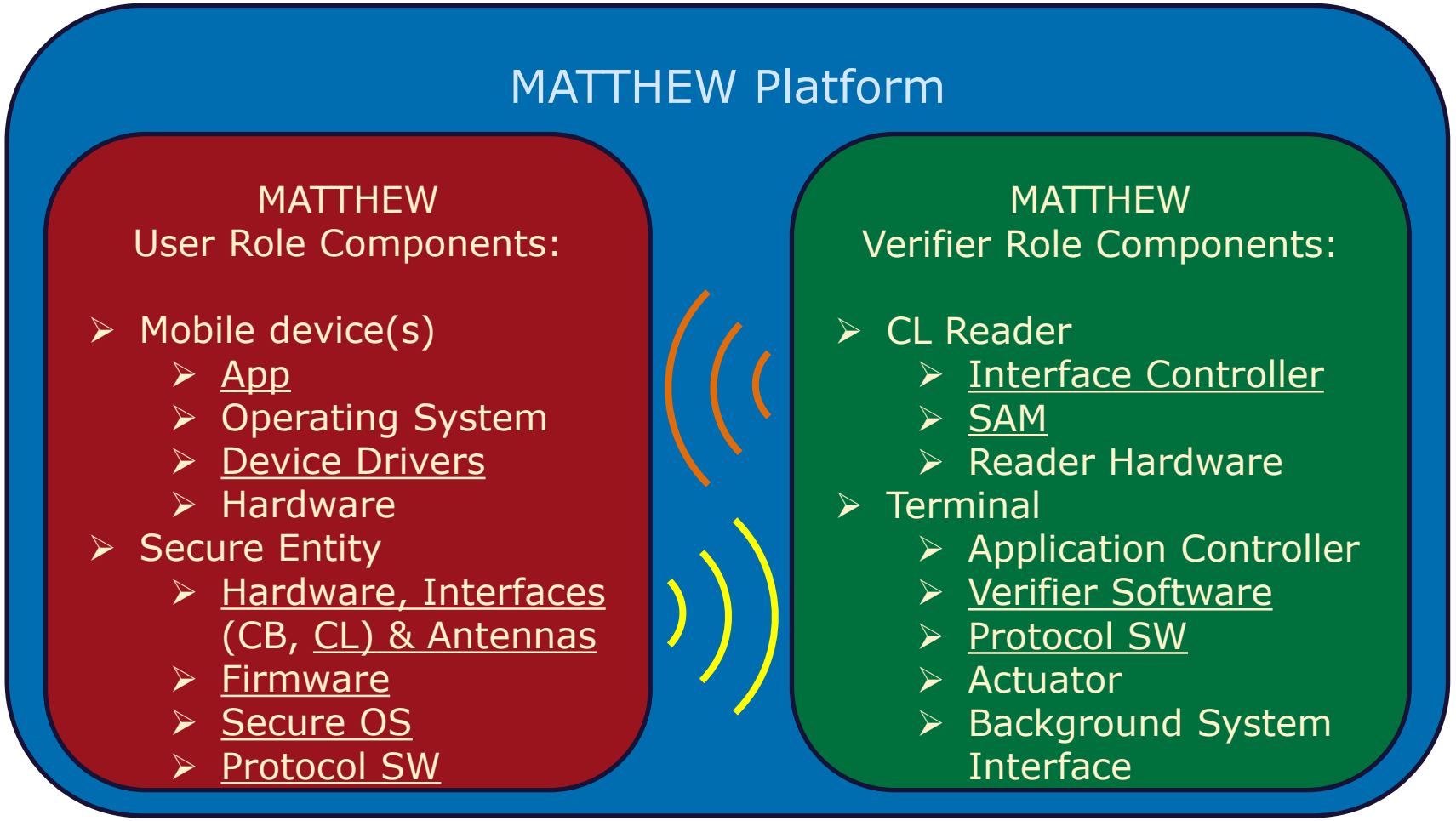
Das Rollenmodell in MATTHEW

- The MATTHEW architecture break down



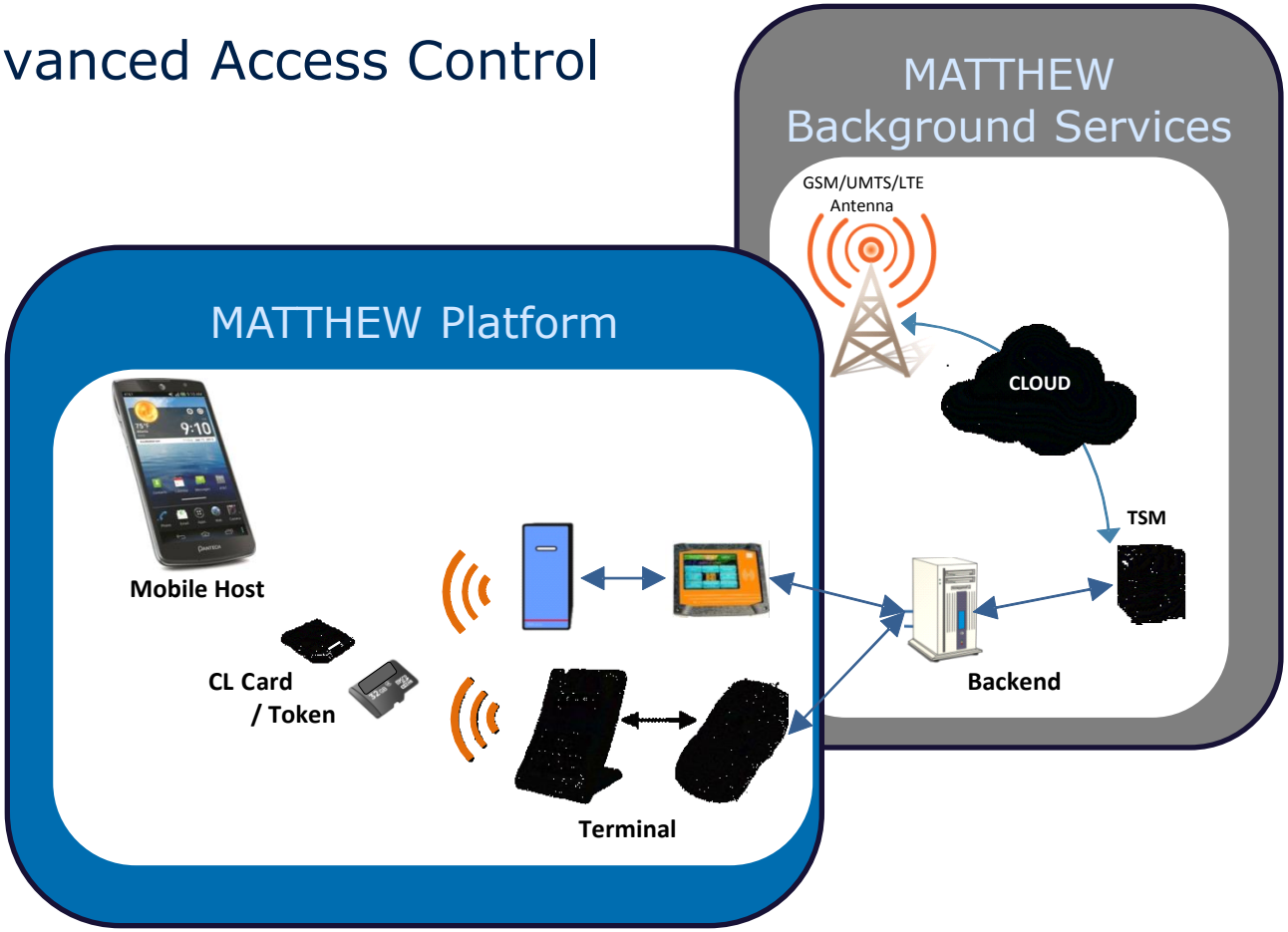
Die MATTHEW Platform

- MATTHEW platform and its Komponenten



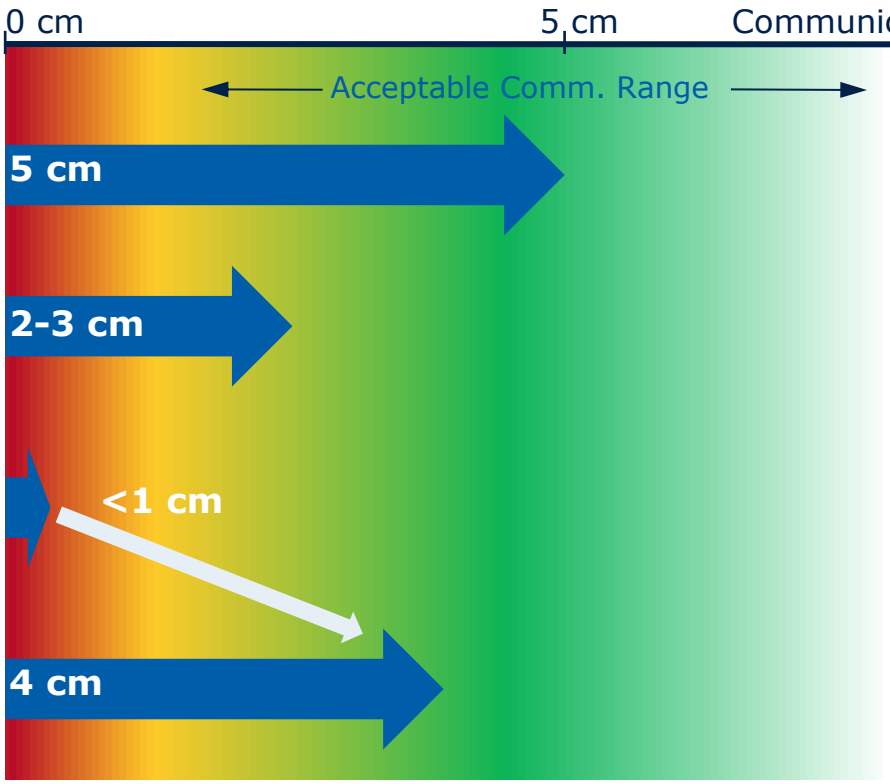
Anwendungsszenarien mit ATT

- Mobile Payment
- Advanced Access Control



MATTHEW Project scope ATT

- Communication Range of Contactless Cards and NFC:



Passive ID1 Antenna (4000 mm²)

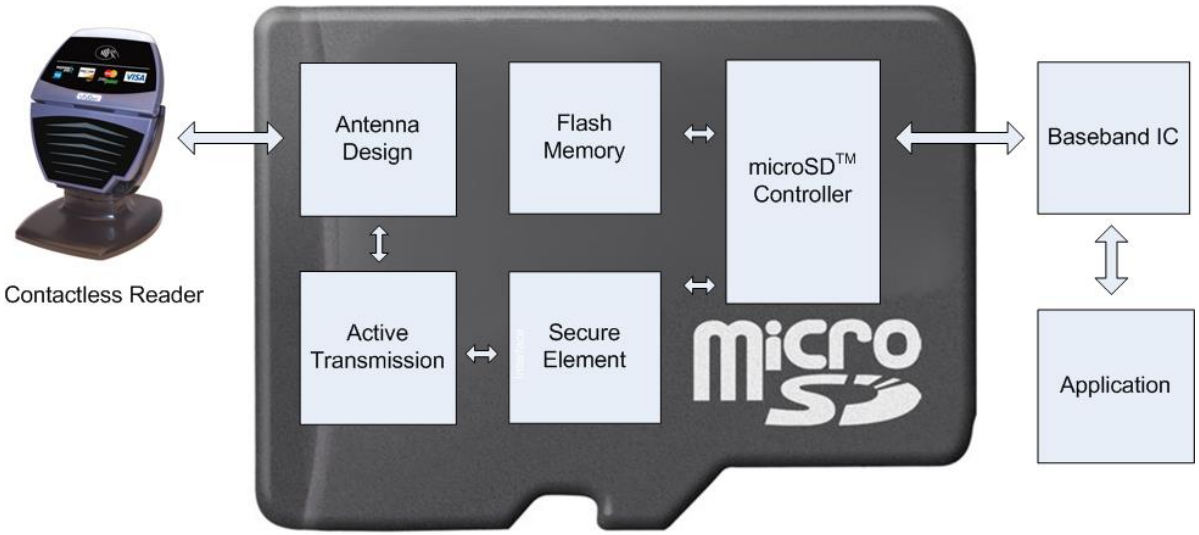
NFC-Mobile, **passive** Modulation (~1350 mm²)

NFC-Mobile, **passive** Modulation in microSD™ Card (~130 mm²)

NFC-Mobile with **active** transmission technology in microSD™ Card (~130 mm²)

- **Add-On** for Security Controller: **Active Communication Interface**
  - New applications, e.g. „standalone NFC" in microSD™ or SIM cards
  - Performance and cost reduction with integrated Solution

Concept



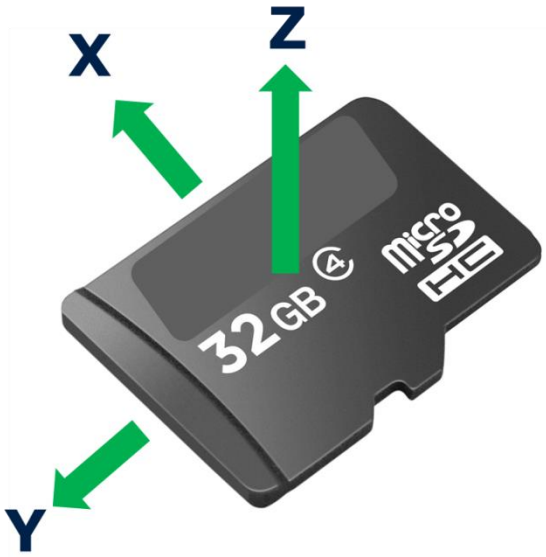
Target: Enabling small form factors using active transmission technology

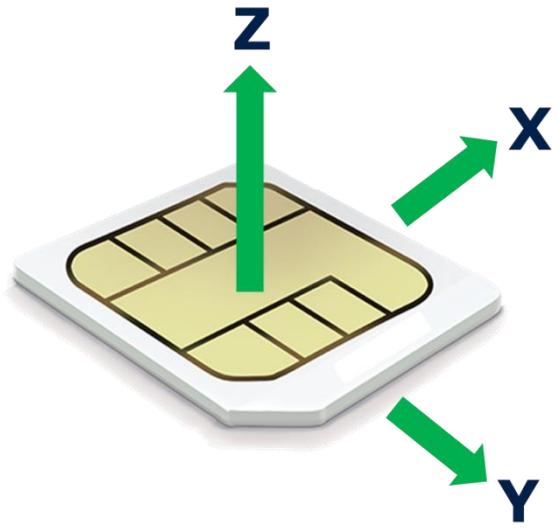
- Communication in spite of mobile-casing and –battery
- Extended communication range due to active modulation
- ….also possible for miniSIM (2FF), microSIM (3FF) and nanoSIM (4FF)

Projekt Fokus Aktive Rückmodulation (ATT)

Forschungsfelder:

- Antenna Design und Bevorzugte Abstrahlcharakteristik
- Simulationsmodelle für diverse Mobile Plattformen
- Active Transmission Technology (ATT)
- Standardisierung der ATT (ISO)
- Interoperabilität mit existierende Reader Infrastruktur
- Integration der ATT mit einem Secure Element

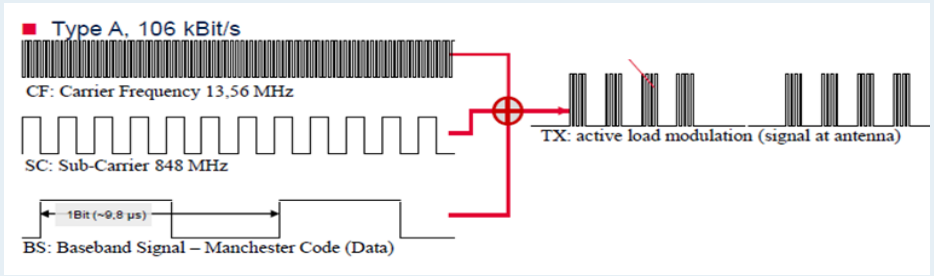




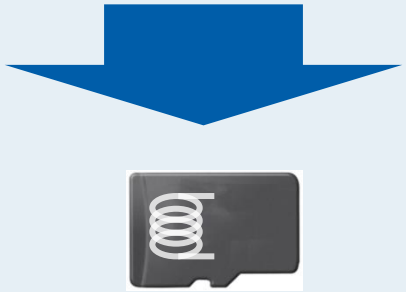
Active Load Modulation – how it works

matthew

- Active Modulation drives against terminal (180° signal shift)
- Uses battery power



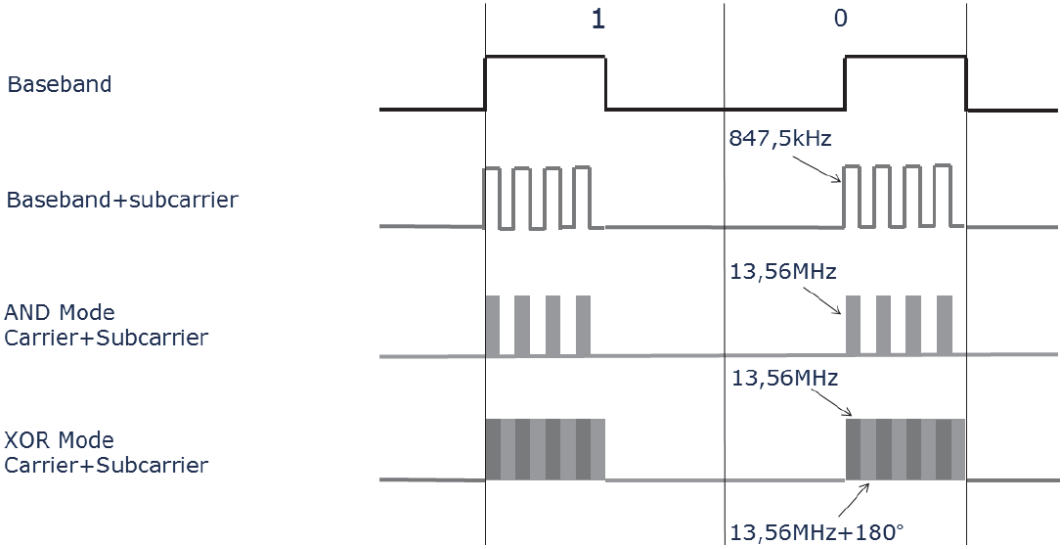
- Active Load Modulation applied in micro antenna form factor

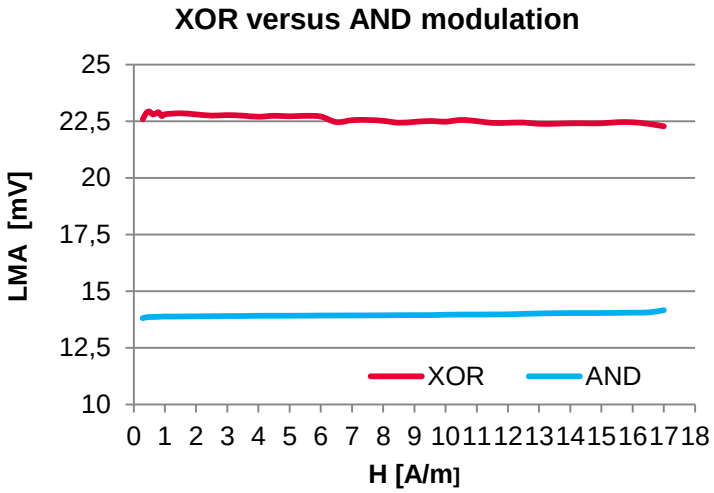


- Reader sees same signal like on contactless ID1 card

Active Modulation Modi

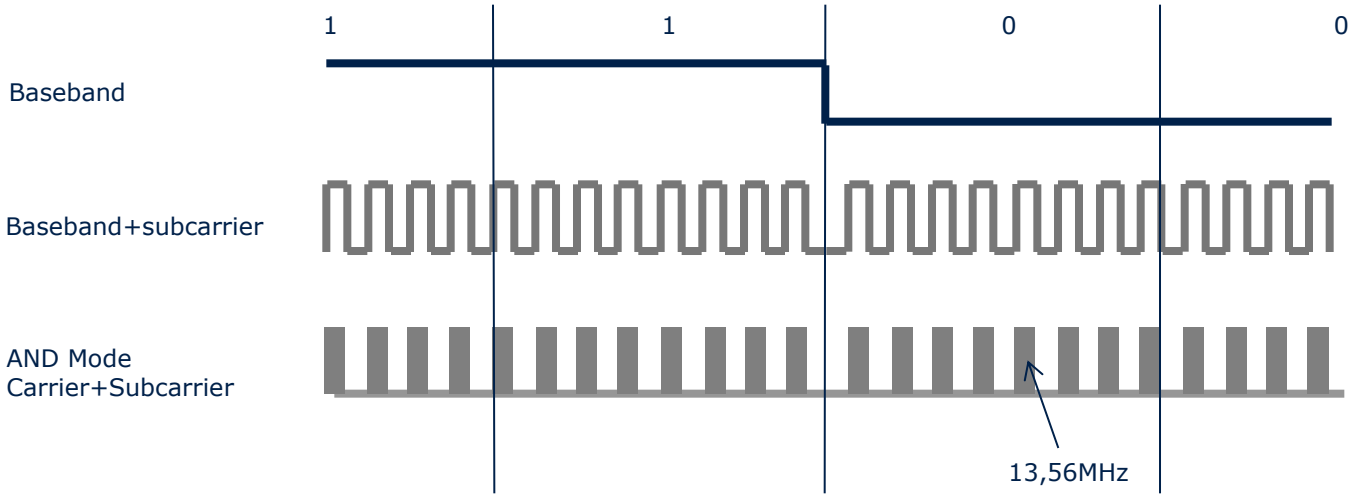
Type A:





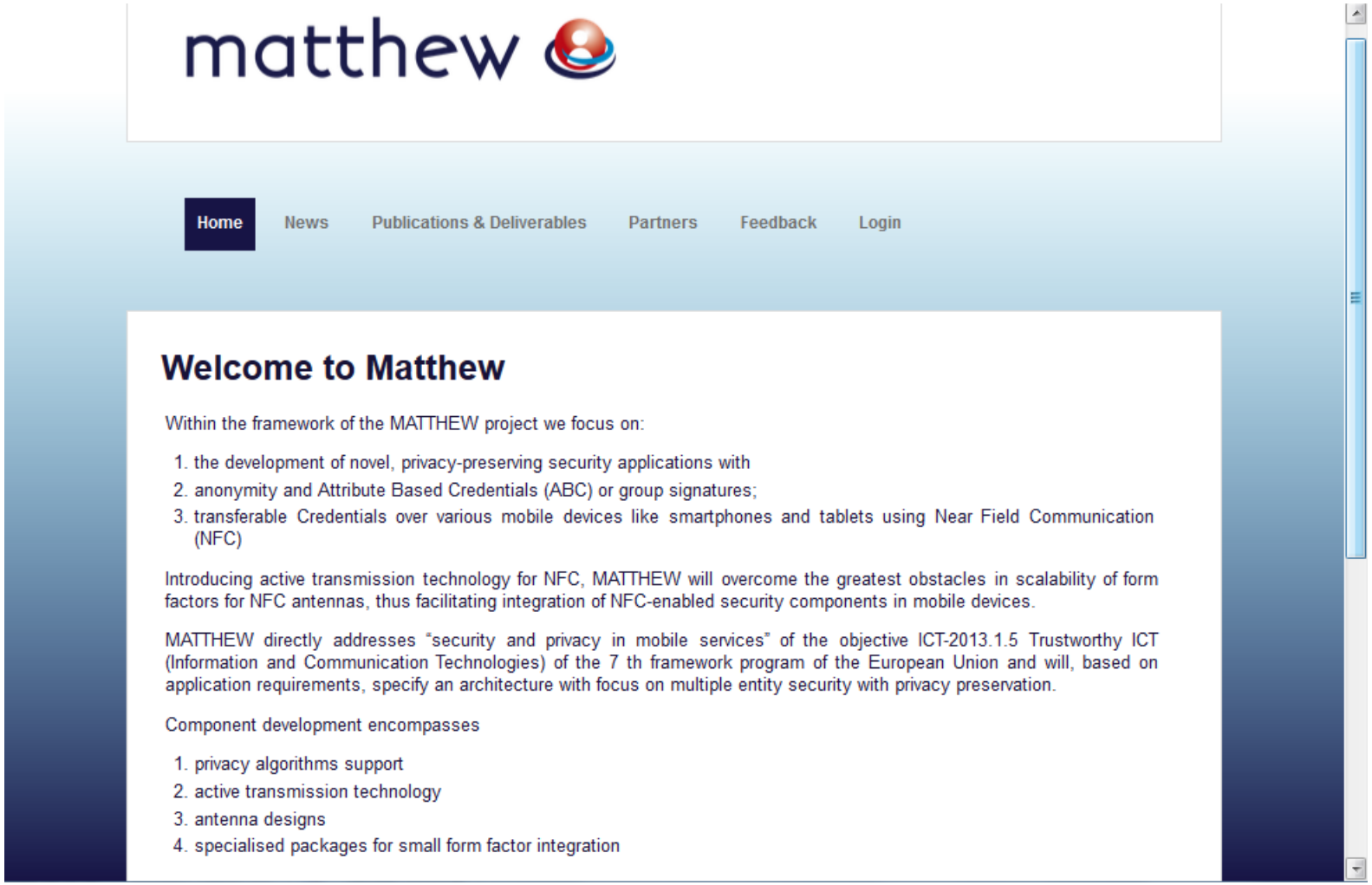
Active Modulation Modi

Type B:



- ISO/IEC 14443, Type A: AND and XOR modulation supported → XOR recommended
- ISO/IEC 14443, Type B: AND modulation supported

Projekt-Homepage



http://matthew-project.eu/

Zusammenfassung

- Trends aus den Anwendungsfeldern eGovernment und mobile Payment
  - VHBR
  - Authentizitätsanker
  - Aktive Rückmodulation
- Anwendungen zeigen den Bedarf nach weiterer Forschung im Sinne von
  - Kommunikationstechnik (“connnectivity”) und
  - Sicherheit (“Security”)

ENERGY EFFICIENCY
MOBILITY
SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.