Countering Counterfeits with Traceability Tech & the World's Smallest Barcodes

PSQR

code®

imZERT™
world's smallest barcodes

Housekeeping

Participants audio and video are disabled

Post questions in chat

This session is being recorded

You'll get the slides via email

Agenda

Introduction

Image-based barcode scanning technology and software

Thomas Rissmann, CODE

The World's Smallest Barcoders For Injection Moulding

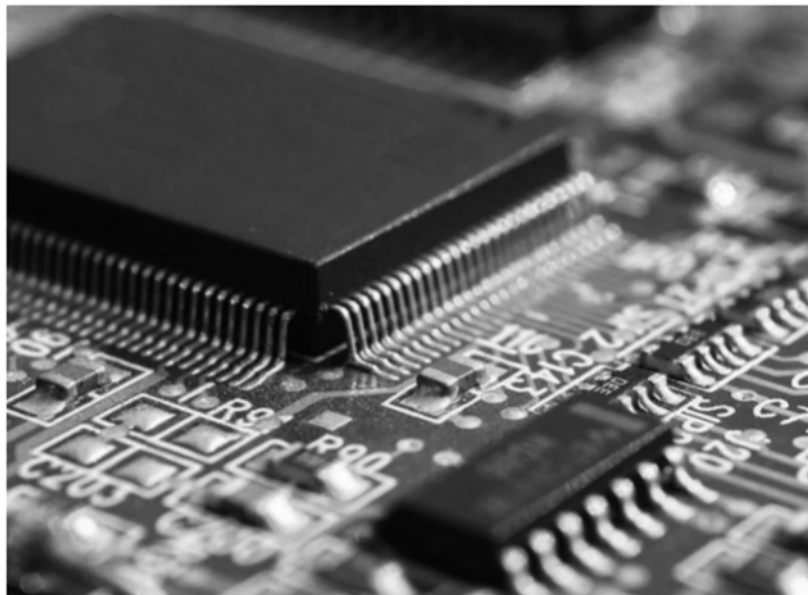Guggi Kofod, imZERT

Electronics and Supply Chain Digitisation

Kim Albertsen, PSQR

Questions & Answers

TECHNOLOGIES > EMBEDDED REVOLUTION

Apple Warns Global Chip Shortage W
to Impact iPhones

Aug. 3, 2021

Search   **Bloomberg**   Sign I

Chip Shortage Forces Carmakers to Leave Out Some High-End Features

By Gabrielle Coppola, Tara Patel, and Debby Wu
6 May 2021, 06:01 CEST

► Automakers cut back on functions to keep production going
► Navigation systems, large displays get nixed as crisis worsens

Explain This: Global Computer Chip Shortages

0:27 / 5:00

Chip Shortage Forces Automakers to Get Creative

Samsung says chips crunch hitting TV appliance production

S Korean group will reallocate manufacturing capacity to address shortage

Samsung forecast that profits from chips would increase in the second quarter on strong demand for serv
sales would fall because of a components shortage © AFP via Getty Images

The global chip shortage opens door to counterfeiters.

3 companies partnering on one amazing tech stack

We are
code®

Empowering Intelligent Decisions through Data Capture

IMAGE PROCESSING, DECODING, SEND & USE

SCAN & CAPTURE IMAGE

GET DATA FROM THE PICTURE

SEND & USE THE DATA

COMPLEX PROBLEM

CODE INTRO

WHY CODE?

- 25 years in business

- Over 1,000,000 scanning devices deployed

- 1 on 1 relationships with each customer

- Customer voice in every product we design

- Our ability to scan is unmatched

- Durability of our products
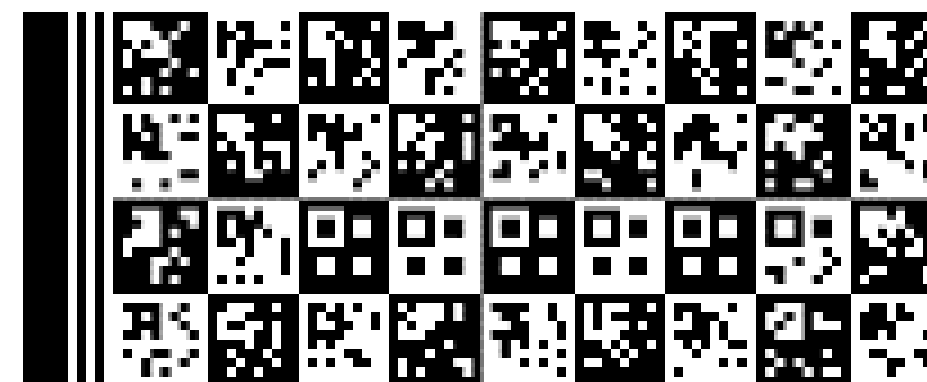
- Support before, during, and after installation

CR2700 in Handled & Palm Versions

25 YEARS OF INNOVATION

1 > 2 > 3 > 4 > 5 > 6 > 7 > 8 > 9 > 10 > 11 > 12 > 13 > 14 > 15 > 16 > 17 > 18 > 19 > 20 > +
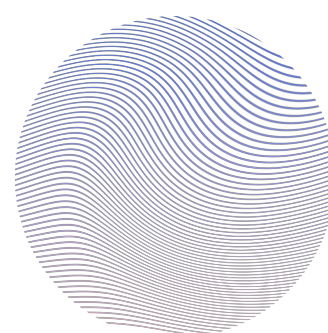
Hand-held imagers

Proprietary Symbology

Soft-Scanning

Mobility

OEM Products

code

GLOBAL REACH
GLOBAL PARTNERS

Strong partnerships with global distributors and regional resellers in over 60 countries

KEY MARKETS FOR CODE

Healthcare	Retail & Commercial	Industrial & Manufacturing	OEM

Healthcare
- Hospitals and Clinics
- No barcode standardization
- Patient Safety Tool
- Ergonomics
- Durability

Retail & Commercial
- Retail, restaurants, banks, post offices, gyms, libraries, etc.
- Less harsh environments
- Read packaging, mobile phones, IDs
- Price driven

Industrial & Manufacturing
- Manufacturing, Warehouses, Service Centers,
- Wide variety of barcodes, including DPM
- Ruggedness
- Interface flexibility

OEM
- Scanning as a integrated component of a larger system
- Kiosks, price checkers, mobile devices
- Size and power consumption
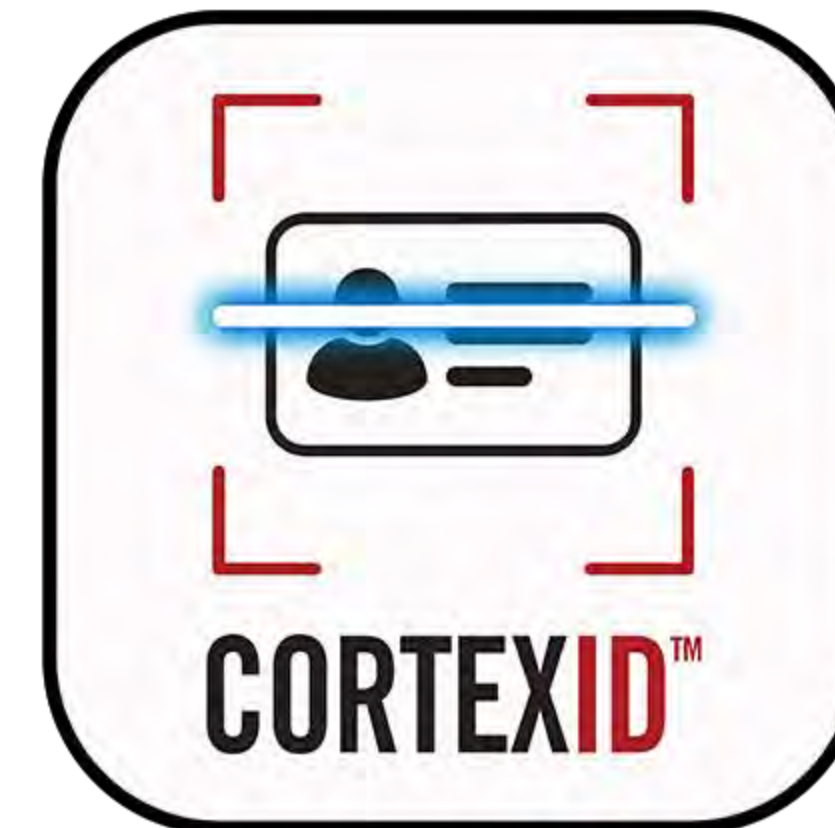- Interface flexibility

PRODUCT LINE UP

Family	CR2700	CR1500	CR1100	CR950	CR5200	CR6000	CR7000	CR8200	Decoder
Healthcare	X	X	X				X		X
Retail & Commercial		X	X	X	X				X
Manufacturing & Industrial	X	X	X	X		X			X
OEM				X				X	X

code®

POWERED BY
CORTEX
DECODER®

CORTEX DECODER® SDK EMBEDDED

CORTEX DECODER® SDK MOBILE

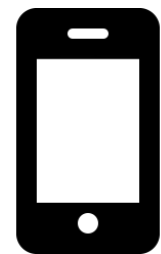CORTEX DECODER® SDK WEB

BATTERYTRAK™

CORTEXSCAN™

CORTEXWEDGE™

CORTEXID™

code QR®

code®

Thomas Rissmann

Director Software Sales EMEA
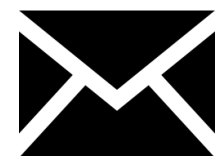
Thomas.Rissmann@codecorp.com

+49-152-22812955

We are here to help!

Reach out today!
codecorp.com
info@codecorp.com
801-495-2200

imZERT™
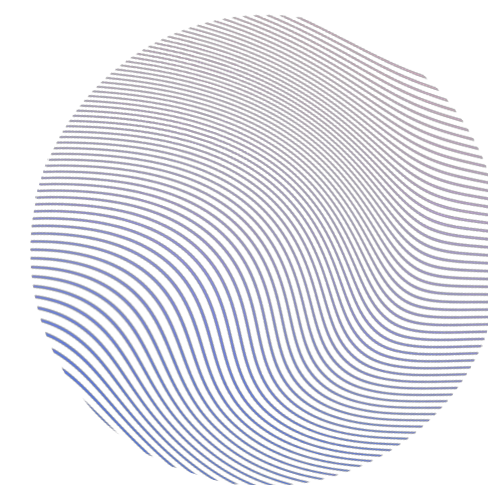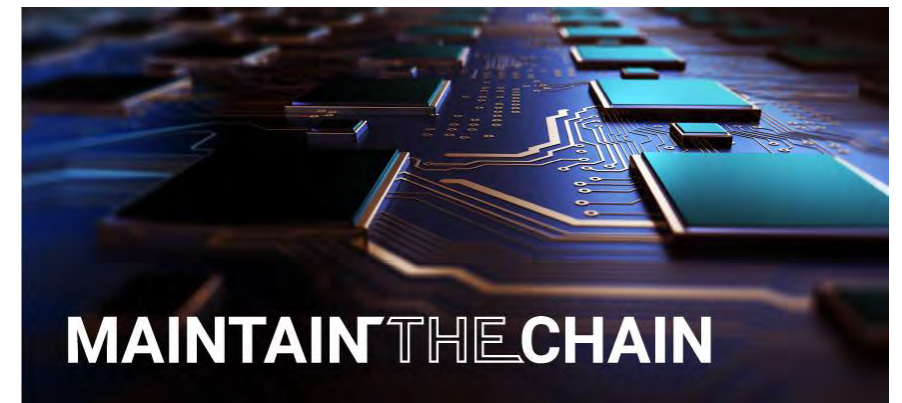
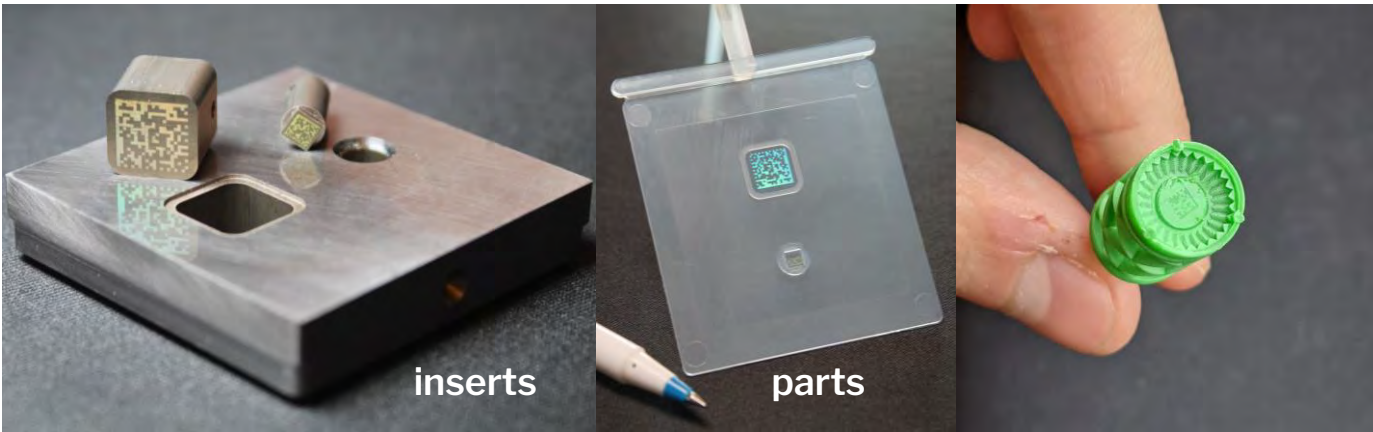"World's Smallest Barcodes" for injection moulding

Traceability drives value

Quality and Efficiency

- Improve **root cause analysis**

- Make **data driven decisions**

- Decrease **Cost of Poor Quality**

- Enhance **automated** production

Defend Brand Value

- Create **authentic watermark** on product

- Strengthen **anti-diversion**

MAINTAIN THE **CHAIN**

inserts

parts

"World's Smallest Barcodes" for injection moulding

- For all plastic and elastomer components

- **High quality and zero contamination**

- **Small barcodes** = down to 1x1 mm²
- **Accurate** = zero marking failures = no waste
- **Nanostructured** = high contrast + high authenticity
- **During Moulding** = no equipment + no more work cycles

- imZERT is **Safe, Accurate** and **Sustainable**
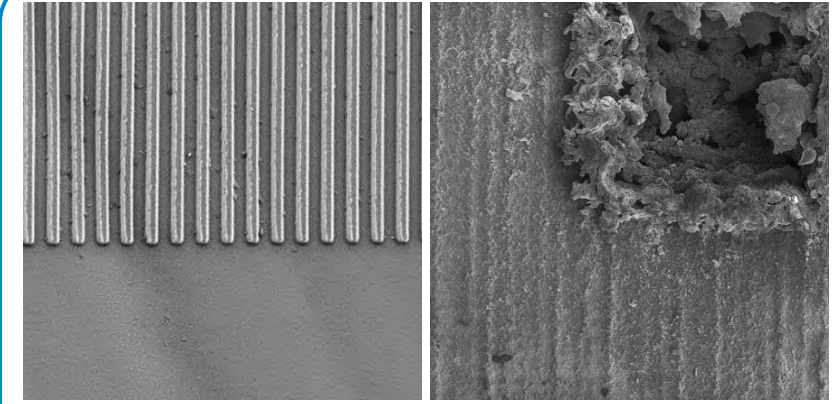

1x1 mm² 2x2 mm²

Video
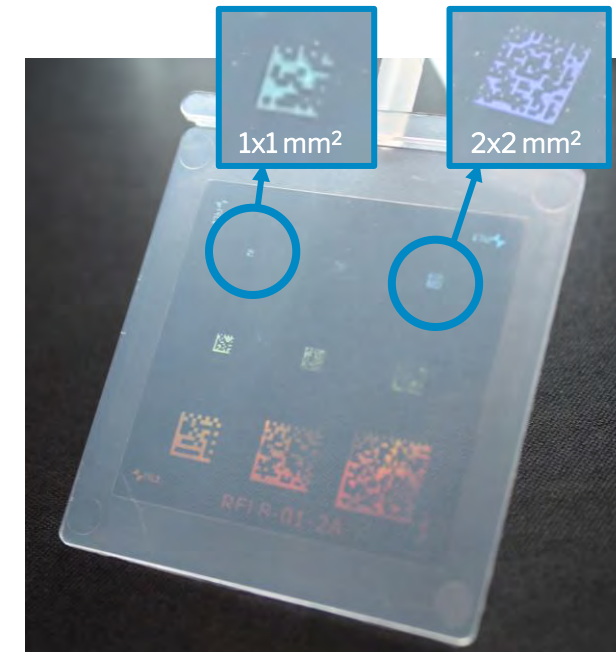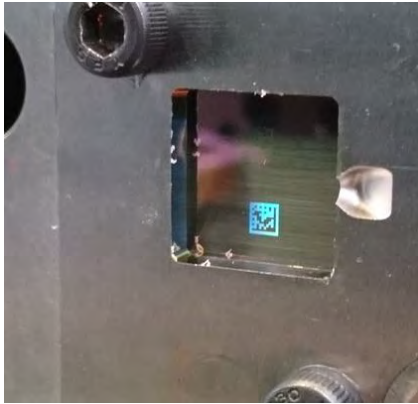
Insert in the mould

Molded trial part and insert

imZERT™:
- Accurate
- Sharp
- Nano-geometry

Laser-engraving:
- Poorly defined
- Blurry edges
- Poor micro-geometry

imZERT™ - Technical features

High quality nanostructures as barcodes

- Direct Part Marking DURING moulding
- Based on hardness coating on tool steel
- Sharp and accurate structures = high optical contrast
- No materials transferred to part = no contamination
- More than 150.000 cycles without wear = high durability
- Patented

Machine-readable with optical scanners

- Inline Vision System / Barcode scanners / Stationary scanners
- Smartphones / smartphone-based readers

All barcodes are possible

- 10x10 mm^2 down to 1x1 mm^2
- Any standard: Datamatrix, QR code, GS1, EAN, etc.

For most polymers and processes

- Injection moulding, hot embossing, injection blow moulding.
- PE, PP, PS, PMMA, PA, ABS, POM, COC, TPU, TPE, LSR, etc.

– small plastic parts are hard to mark!

Typical **Problems** with Direct Part Marking

÷ Label and direct laser-writing **expensive**

÷ Hologram label and RFID are **separate and expensive items**

÷ Marking of **small parts impossible**

÷ Marking **after moulding** – no tracking during production

÷ Manual intervention and **maintenance costs**

÷ Equipment **breakdown risks** – can stop production

÷ Accurate **mark positioning** is difficult

÷ Ink or label causes **contamination** of product

÷ Laser-engraved DPM are **poor resolution**
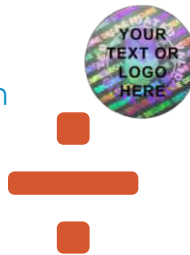
imZERT™

Advantages and **Benefits** of imZERT

+ **Zero contamination**. None!

+ **No work-cycles** – part is already marked in the mould.

+ **No impact on molding process or cycle-time.**

+ No Labels. No RFIDs. **No automation equipment.**

+ No Lasers. No Ventilation. No pigment master batches.

+ **No maintenance** of marking equipment – no breakdowns.

+ Compatible with one-time sterilization.

+ Simple integration in mould cavity with several options.

+ **Accurate** positioning on part – every time.

+ **Small DPM, down to 1x1 mm^2!**

+ Batch ID through sorting, during mould downtime or while mounted.

+ **Traceability starts at moulding** – not just point of marking.

YOUR TEXT OR LOGO HERE
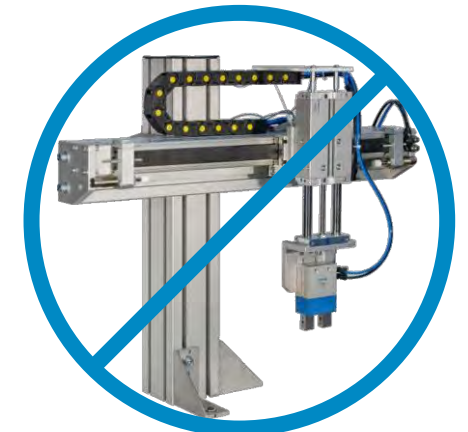
imZERT™
implementation

Customer specification
- Barcodes content and standard.
- Geometry: round, square or pin. Size.

Datamatrix and QR Code

Mould maker integration
- Prepares receiving hole in mould.
- Can be applied to existing mould.

Moulding setup
- Works in standard moulding conditions.
- Keep barcode clean – do not scratch.

Scanning
- Works well with Vision systems in automation
- Smartphone app CortexScan extremely good

Batch replacement
- Simple geometries enable fast exchange
- Mould must be designed for fast exchange
- Barcode content free
  - Keys? Consecutive numbers?

imZERT
More information
Machine-readable
Replaceable / Updateable
Vision System ready

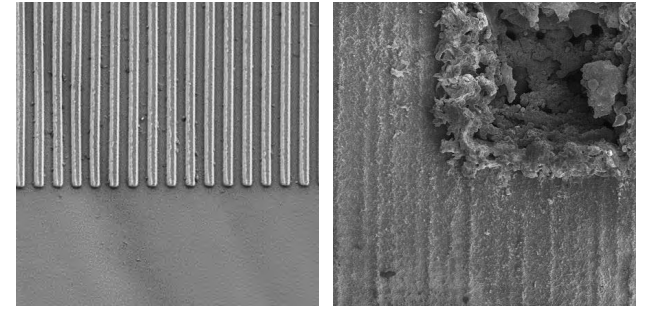# How does imZERT™ protect against product piracy?

- **Nanostructured** barcodes are modern **watermarks** directly on the product

- **Direct copy is impossible** – imitation is extremely hard

- **Embedded** in and inseparable from product

- Clearly and obviously **not a sticker** - testable

- Tamper-proof / **tamper-evident**

white light
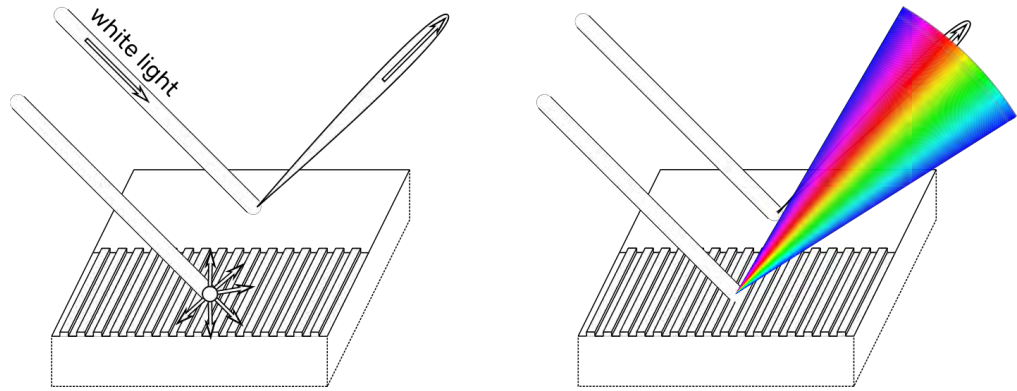
Extremely hard to copy

imZERT™:
- Accurate
- Sharp
- Nano-geometry

Laser-engraving:
- Poorly defined
- Blurry edges
- Poor micro-geometry

imZERT applies nanostructured barcodes with extremely sharp features. The lines can be modified to include micrometer-sized logo and text.

- Based on sharp and accurate nanostructures

- Nanostructures diffract light for "rainbow effect"

- Logos and nano-writing can be included to add further authenticity
  - (Real images above, image manipulation below).

- Direct copy impossible

- Patented process – critical steps non-disclosed

Image edit
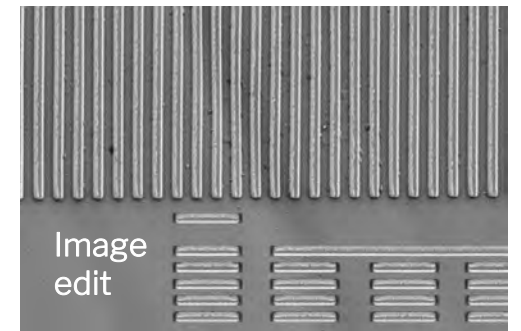
## Counterfeiting attack strategies – and how to defend

- Attacker may leave out barcodes → easy to detect

- Attacker may use barcode stickers (2x2 mm^2?) → easy to detect

- Attacker may attempt laser-engraved barcodes → easy to detect

- Attacker may place barcodes on label to confuse → education of end-user

Detective and investigative support

- Is barcode only on external packaging and not on the part?

- Does it sit in the right place on the part?

- Check: does barcode exist? Correct placement and information?

- Forensic checks: does the barcode contain nanostructures? (cheap test)
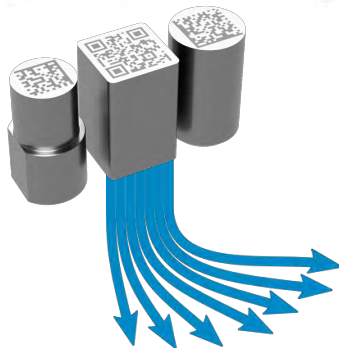
Example implementation: intelligent sorting

- Individual cavities for moulding caps receive individual barcodes
  - (Assuming 16 cavities in mould)
- Automated sorting into separate bins
  - All barcodes in bin are now identical = 16 individualized batches/lots
  - Can be directed into specific distribution and sales streams
    - Detects specific barcodes being "hacked" / "copied"
    - Detects diversion / parallel import (re-packaging doesn't remove barcodes)

imZERT™

"World's Smallest Barcodes" for injection moulding

by REL8

Rel8 ApS
Savsvinget 4, 2970 Hørsholm, Denmark
E-mail: info@rel8.dk
Phone: +45 / 5197 4724

Drivers of Supply Chain Digitisation

PSQR

Regulatory Compliance

- TPD (EU)
- FMD / MDR / IVDR (EU)
- DSCSA (US)
- FSMA 204 (US)
- CRPT (Russia)

Operational Excellence

- Inventory management
- Logistics optimisation
- Reduce risk
- Performance improvements
- Supply chain forensics

CSR Goals

- Sustainability
- Auditability
- Provenance
- Integrity
- Transparency

Brand Management

- **Counterfeit mitigation**
- Aftermarket
- Customer safety
- End-user engagement
- **Divergence / Gray market**

Cases to exemplify

Consumer Electronics:

Like many other global brands, Jabra is facing the **challenge of counterfeiters**, which continuously try to exploit the Jabra brand and the success that we enjoy.

Counterfeit products have usually not been through official certification processes, and often have overall poor quality with respect to performance as well as component construction. They also have potential safety issues that may cause harm to consumers. The counterfeit products often fail to offer the same level of interoperability and support as genuine Jabra products, resulting in high returns rates and customer dissatisfaction.

https://www.jabra.com/about/anti-counterfeit?_ga=2.244549957.138111090.1630318 487-1918922813.1630318487

Microchips:

The global chip shortage is creating a new problem: More fake components

Industry analysts believe that the global chip shortage is creating **the perfect environment for counterfeit** semiconductors to enter the market.

"We can be sure it will happen again, but this time it will be all components, not just chip capacitors," says Calabria.

The risks of using counterfeit chips, even unknowingly, should not be underestimated.

https://www.zdnet.com/article/the-global-chip-shortage-is-creating-a-new -problem-more-fake-components-as-fraudsters-cash-in/

Enabling transparency and traceability

- Unique ID (UID) on item level (serialization) or small batch level
- Printing, imprints or labels on the each (individual) item
- Scanning and collection of data on the production line
- Collection of data from enterprise software solutions
- Logging of supply chain events
- Data synchronization and harmonisation
- Data storage and accessibility to operationalise realtime
- Utilisation and creation of data value

  - Reports
  - Dashboards
  - Control tower
  - Business rules
  - Alarms and metrics

We are track and trace software experts
and digital supply chain enthusiasts

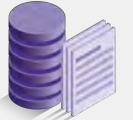# Our software solutions empower others to

Accumulate and store data ──○

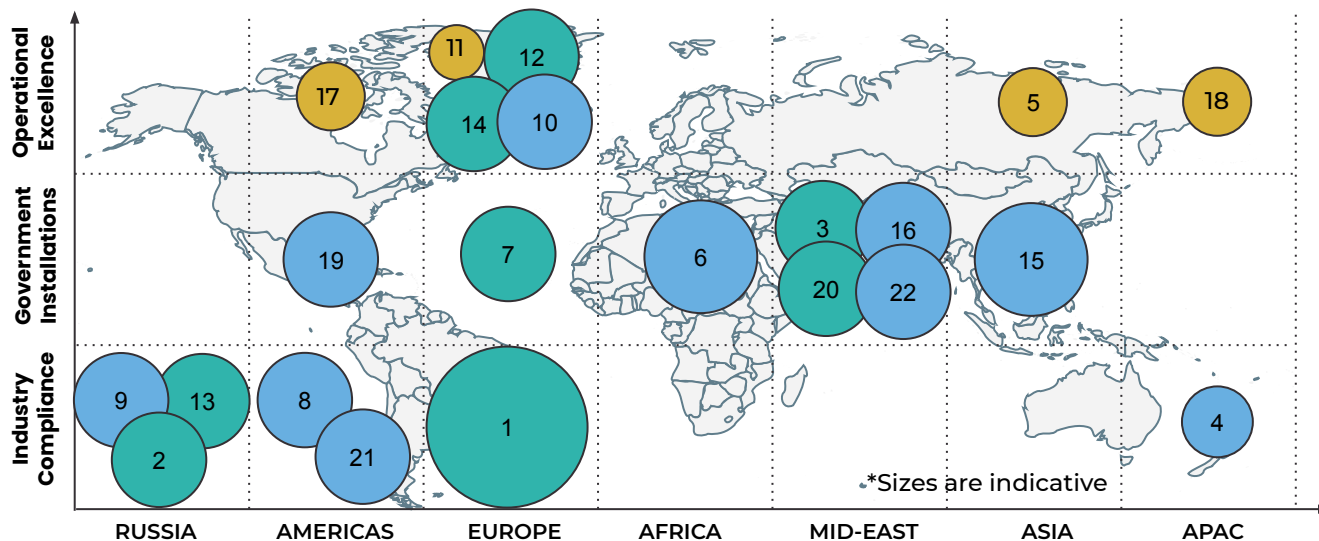**Find products across the supply chain**

Access and share this data ──○

Tell the true supply chain story ──○

Deployment landscape

PSQR

*Sizes are indicative

RUSSIA   AMERICAS   EUROPE   AFRICA   MID-EAST   ASIA   APAC

1. TPD / tobacco
2. Dairy products
3. Carbonized beverages
4. Fresh produce
5. Seafood
6. Petrochemicals / gas
7. Tobacco
8. Alcoholic beverages
9. Alcoholic beverages
10. Asset mngt - hospital
11. Asset mngt - aviation
12. Pharmaceutical industry
13. Tobacco products
14. Asset mngt - hospital
15. Tobacco products
16. Tobacco products
17. Alcohol / beverages
18. Fresh produce
19. Alcohol / beverages
20. Carbonized beverages
21. CPG industry
22. Tobacco products

15 active deployments keeping track of more than **20 billion** serialised products across **250 factory** installations.
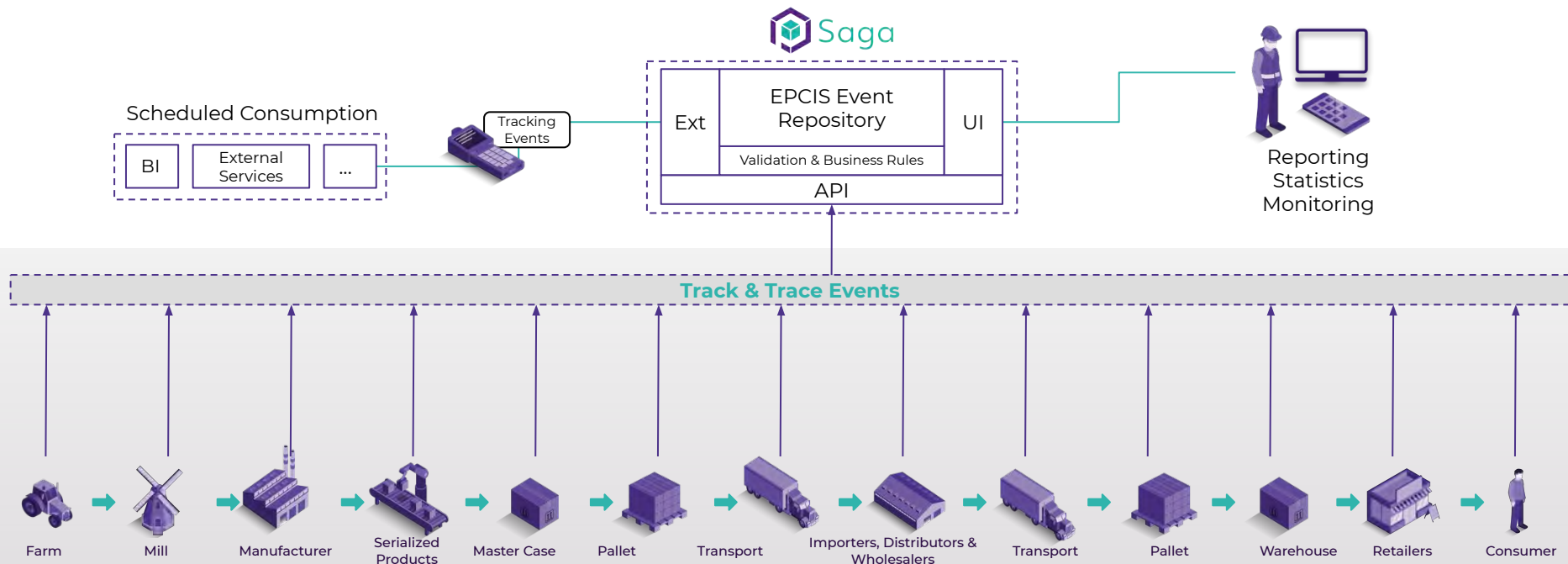
Active deployments

Under way

Pilots

Saga - Track & Trace Solution

PSQR

Saga

Scheduled Consumption

| BI | External Services | ... |

Tracking Events

Ext

EPCIS Event Repository

Validation & Business Rules

UI

API

Reporting Statistics Monitoring

Track & Trace Events

Farm → Mill → Manufacturer → Serialized Products → Master Case → Pallet → Transport → Importers, Distributors & Wholesalers → Transport → Pallet → Warehouse → Retailers → Consumer

One technology
A multitude of industry applications

Scalable technology and software to store, process, and analyse billions of track and trace events.

Saga collects data and helps to tell the story of the the origin, the journey, the whereabouts and the consumption of products, goods, resources and assets.

Receives data from a myriad of sources through API extensions

Validate and verify data, codes and information according to preset criteria and business rules

Saga

REPOSITORY

Ext API

Validation & Business Rules

Core API

UI
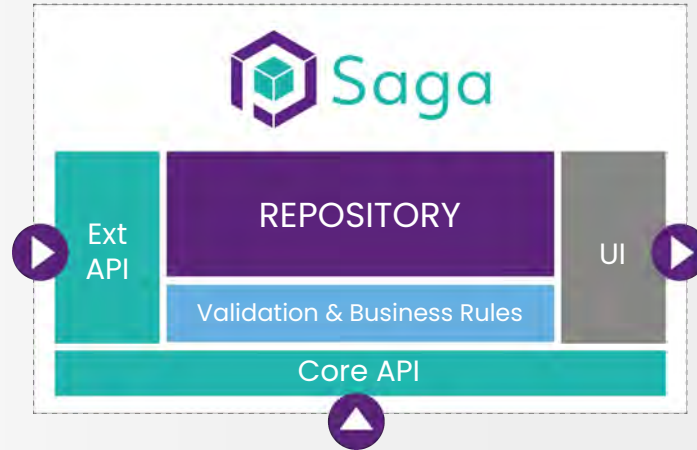
Makes data available and transfers data to third party systems, sophisticated User Interfaces and Dashboards

Delivers a User Interface to track and view data

Provides a sophisticated data store or repository where the data received is accumulated and stored
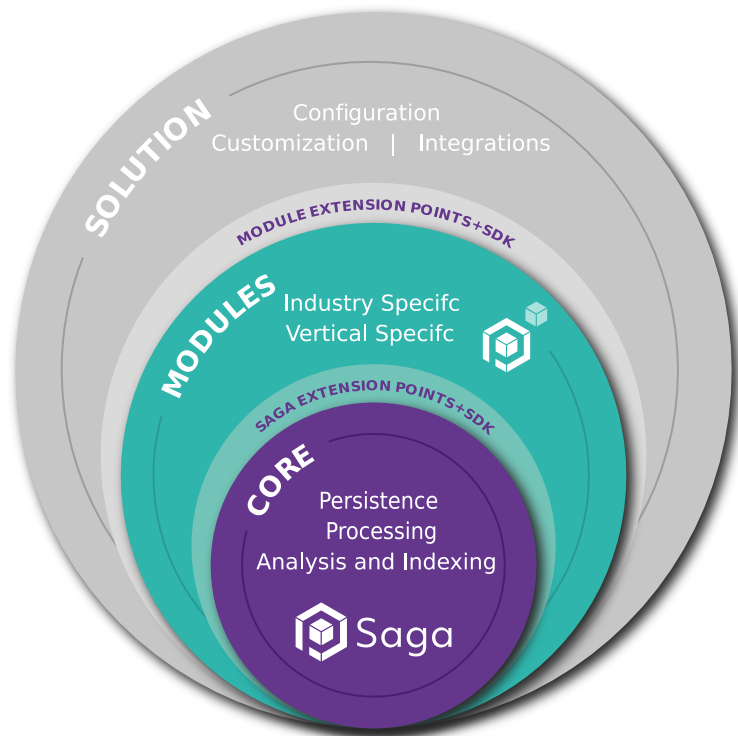
Saga - in Track & Trace Stack Context

PSQR

- Collect data from L3/L2 Systems

- Harmonize with data from other L4 systems

- Async processing - minimize operational impact

- Secure Eventual Consistency

- Report to Authorities and establish holistic overview

Government	Level 5 — Regulatory	Compliance Repository
Enterprise	Level 4 — Corporate	Centralized Track & Trace Repository
Production Lines, Factories, and Warehouses	Level 3 — Factory & Warehouse	Work Order Data / Supply Chain Data
	Level 2 — Production Line	Serialization Data / Aggregation Data
	Level 1 — Devices	Marking / Scanning / Verifying
	Level 0 — Products	
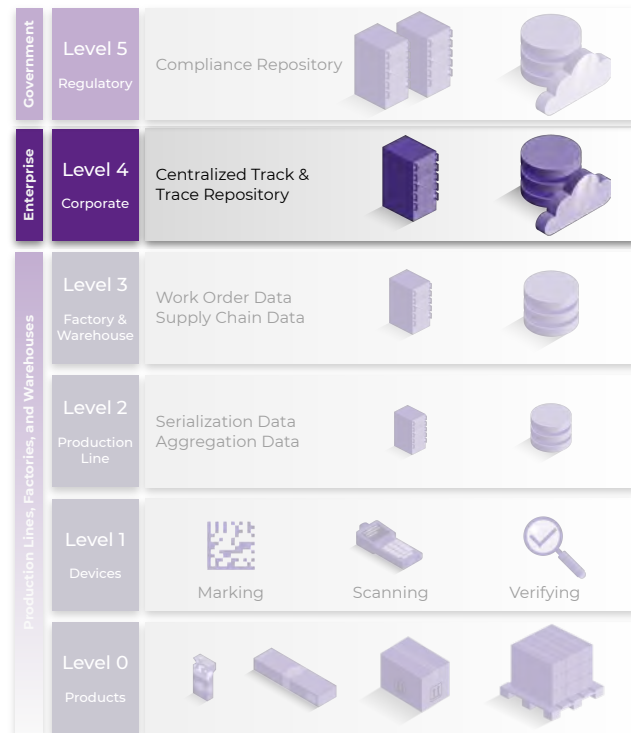
Extensible and Modular Technology

PSQR

SPECIFIC
Reusable functionality | feature specific to certain verticals/industries

COMMON
Reusable functionality | feature specific to certain verticals/industries

FOUNDATION
Core functionality used in all traceability solutions

PSQR differentiators

- **Robust** - proven with volume, complexity, speed
- **EPCIS based** - seamless exchange of data with enterprise solutions: ERP, MES, WMS...
- **Extendable** - multiple data exchange options
- **Modular** - Flexible to tailor for each customer and fit around existing processes
- **Agnostic** - tech, cloud and industry
- **Economic** - open source technology and minimum infrastructure footprint
- **Scalable** - build for scale and low cost items
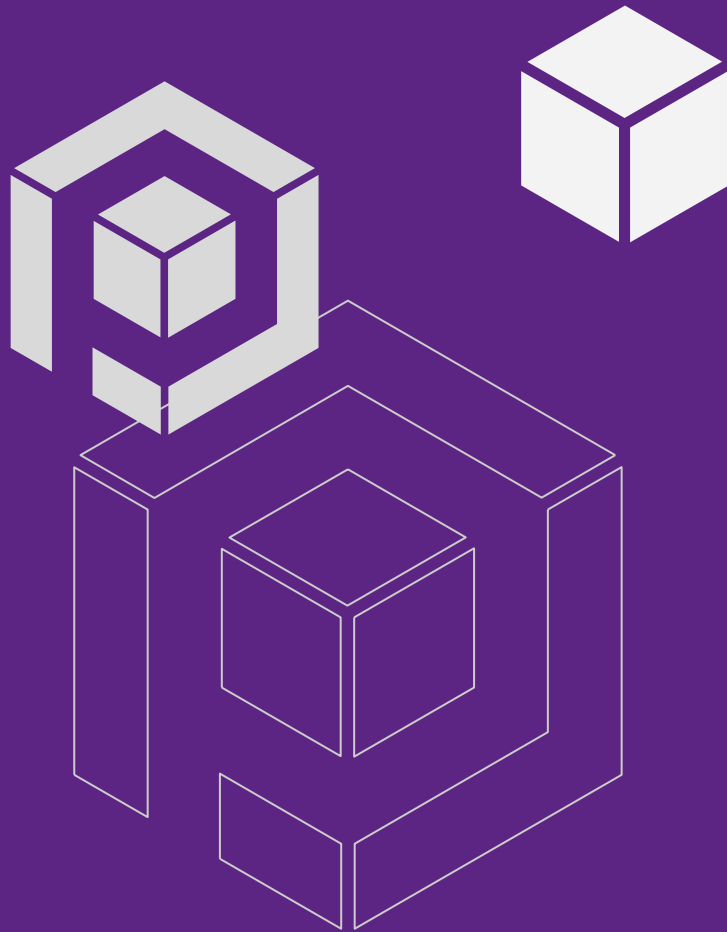
KIM ALBERTSEN
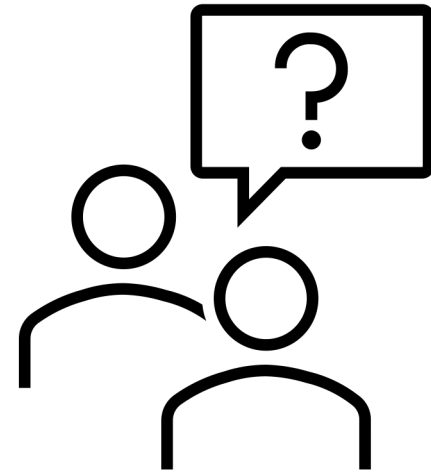Head of Commercial Affairs
aka@psqr.eu | M+45 22 55 51 19

www.psqr.eu   Follow us on LinkedIn   PSQR

Q&A

Thank you

PSQR

www.psqr.eu

aka@psqr.eu

imZERT™
world's smallest barcodes

www.imzert.com

info@rel8.dk

code®

www.codecorp.com

Thomas.Rissmann@codecorp.com