Industry & Logistics Solutions

100% Identification Technology
**Industrial Internet of Things**

IIoT* contains big data technology, utilizing sensor data, machine-to-machine (M2M) communication and technologies for industrial automation. Smart devices are more efficient than humans regarding accurately, consistently capturing and communicating data. This data can enable companies to save resources and support business intelligence efforts. Particularly in manufacturing environments, IIoT holds comprehensive potential for quality control, sustainable acting, supply chain traceability and efficiency.

The IoT** offers innovative opportunities to create solutions that connect digital and physical components as well as services and support.

*) IIoT = Industrial Internet of Things

**) IoT = Internet of Things
IoT Solutions and Scenarios

DOCK DOOR
- Supply Chain Management
- Incoming Goods
- Outgoing Goods

RETURNABLE TRANSPORT ITEMS
- Stock Management
- Track and Trace
- Sorting

ASSEMBLY LINE
- Track and Trace
- Lean Production
- Quality Control

REAL-TIME LOCATION SYSTEM
- Track and Trace
- Stock Management
- Security

FORKLIFT
- Mobile Reader Application
- Stock Management
- RTI* Management

eKANBAN
- Live Stock Management
- Lean Material handling
- Quality Management

RAILWAY LOGISTICS
- Supply Device Management
- Fleet Management
- Maintenance

VEHICLE LOGISTICS
- Supply Chain Management
- Quality Management
- Prototype

*) RTI = Returnable Transport Items
Solution Overview

Solution Landscape

<table>
<thead>
<tr>
<th>Application</th>
<th>Cross Talk</th>
<th>RRU-series</th>
<th>ARU-CSB-series</th>
<th>ARU-series</th>
<th>M-ARU-series</th>
<th>RUIH-ACD-M260</th>
<th>WIRA 30°/70°</th>
<th>MIRA</th>
<th>SMSH</th>
<th>RTLS</th>
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<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Returnable Transport Items</td>
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<tr>
<td>Assembly Line</td>
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<tr>
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<tr>
<td>Forklift</td>
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<tr>
<td>eKanBan</td>
<td>✔️</td>
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<td>(%)</td>
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<tr>
<td>Vehicle Logistics</td>
<td>✔️</td>
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Next Generation of RFID/IoT Systems

The 3rd generation of the RRU and ARU UHF RFID readers set a new benchmark for IoT systems and connectivity. With the high degree of versatility of the communication modules, the systems enable IoT applications to be integrated easily and seamlessly into existing IoT landscapes, without huge efforts for the infrastructure. To meet all requirements of Industry 4.0, the systems have highly efficient integrated multicore industrial PC (iPC) to process applications, filter algorithms for data mining and business events directly on the device.

- Exceptional performance
- Integrated multicore iPC
- Advanced integrated visualization
- Optional communication modules
- Efficient & seamless design

Hardware Overview

RRU Series

ARU-CSB Series*

ARU Series*

M-ARU Series*

UHF Mobile-Terminal

Wide Range Antenna 30°/70°

Mid Range Antenna 100°

Smart Shelf Antenna*-module

*) Integrated Antenna
CrossTalk 3.0 IoT-Suite

- CrossTalk is the most advanced software suite for AutoID & IoT device management and Track & Trace visualization
- CrossTalk DeviceManagement delivers plug & play integration for most of the AutoID devices and backend systems on the market. It allows a mix of technologies from major RFID/AutoID, RTLS, Barcode and Sensor providers
- CrossTalk AppCenter provides many visual track & trace applications out of the box. CrossTalk’s highly configurable, modular and customizable approach fits into any customer scenario.

CrossTalk Base Platform

Functions
- DeviceManagement
- RTLS Infrastructure
- Backend Integration
- CrossTalk Agents
  - Plug and Play device integration
  - Realtime data capturing
  - Event processing
  - Intelligent filtering

CrossTalk Full Platform

Functions
- CrossTalk Base Functions
- CrossTalk AppCenter
  - Custom Apps
  - Business Apps
- CrossTalk Repository
  - Highly scalable data storage
  - Distribution platform
  - EPCIS compatible
- Event Distribution Platform

*) CT = CrossTalk
### CrossTalk – RTLS Infrastructure

#### Visual Designer
- Build any location hierarchy using plant, site, area and zone elements.
- Visualize objects in geo-based and layout-based maps.
- Binding link between physical devices and business logic.

#### Layout Map View
- Define zone border tolerance and fencing to prevent zone swapping.
- Determination of sequences (A → B → C).
- Track & Trace
- Visual location editor to load and calibrate maps, draw and move zones.
- Handle localization events from active/passive RFID and RTLS systems, Barcodes, GPS tags and vehicle positioning.
- Define fixed read points as positioning markers and gate movements.
- Forward logical localization results as business events to other APP’s or backend systems.
Dock Door Overhead

Details

1. Core Application
   Medium tag density
   Limited installation space

2. Features
   Integrated antenna design
   Circular switch beams
   Configurable read zone
   Direction detection
   Low installation cost
   False positive read filtering
   © KRAI Technology

3. Hardware
   ARU-CSB

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G

Dock Door Gate

Details

1. Core Application
   High tag density
   Reduced tag performance

2. Features
   High speed identification
   Direction detection
   False positive read filtering
   © KRAI Technology

3. Hardware
   RRU, WIRA 30°/70°

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G
**Returnable Transport Items Gate**

**Details**

1. **Core Application**
   - High tag density
   - Limited installation space

2. **Features**
   - Integrated antenna design
   - Circular switch beams
   - Configurable read zone
   - Direction detection
   - Low installation cost
   - False positive read filtering

© KRAI Technology

3. **Hardware**
   - ARU-CSB

4. **Software**
   - CrossTalk

5. **Interfaces**
   - PoE, WiFi, 2G / 3G

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**Returnable Transport Items Sorting**

**Details**

1. **Core Application**
   - High speed identification
   - Reduced tag performance

2. **Features**
   - High speed identification
   - Selective read zones
   - Profinet integration
   - Dense reader environment

© KRAI Technology

3. **Hardware**
   - RRU and MIRA
   - Optional M-ARU

4. **Software**
   - CrossTalk

5. **Interfaces**
   - PoE, WiFi, 2G / 3G
Assembly Line

Details

1. Core Application
   Complex tag orientation
   Reflective environment

2. Features
   Selective read zones
   Polarization switch
   ProfinET integration

© KRAI Technology

3. Hardware
   ARU

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G

Real-Time Locating Systems

Details

1. Core Application
   Item localization
   Indoor / Outdoor

2. Features
   High accuracy
   Real-Time location
   ProfinET integration

© KRAI Technology

3. Hardware
   RTLS-System

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G
### Forklift

**Details**

1. **Core Application**
   - Mobile application
   - Forklift terminal
   - Yard management

2. **Features**
   - Warehouse management
   - Manufacturing logistics
   - Mobile read point
   - Optional Mobile-Terminal

3. **Hardware**
   - ARU, M-ARU
   - RUH-ACD-M260

4. **Software**
   - CrossTalk

5. **Interfaces**
   - PoE, WiFi, 2G / 3G

### eKanBan

**Details**

1. **Core Application**
   - KanBan
   - Workplace monitoring
   - Point of sale
   - Retail

2. **Features**
   - Selective read zones
   - Up to 32 antennas per reader
   - Cascadable
   - Limited installation space
   - No shielding needed

3. **Hardware**
   - RRU, Smart-Shelf antennas

4. **Software**
   - CrossTalk

5. **Interfaces**
   - PoE, WiFi, 2G / 3G
Railway Logistics

Details

1. Core Application
   Vehicle localization
   Maintenance optimization

2. Features
   High speed identification
   Direction detection
   Traceability
   Localization
   © KRAI Technology

3. Hardware
   RRU and WiRA 70°
   ARU

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G

Vehicle Logistics

Details

1. Core Application
   Vehicle localization
   Stock management

2. Features
   Integrated antenna design
   Circular switch beams
   Configurable read zone
   Direction detection
   Low installation cost
   Robust performance
   Outdoor proven
   © KRAI Technology

3. Hardware
   ARU-CSB

4. Software
   CrossTalk

5. Interfaces
   PoE, WiFi, 2G / 3G
Service Portfolio

- Planning
  - Feasibility Study
  - Survey
  - Network Design
  - Implementation Planning

- Implementation
  - Installation
  - Start-Up
  - Project Approval
  - Integration
  - System Approval

- Project management
  - 24/7 Technical Hotline
  - On-site Service
  - Software Service
  - Hardware Service
  - Spare Parts Management
  - Repair Service

- Maintenance
  - Fault Management
  - Configuration Management
  - Performance Management
  - Security Management

- Operation
Support Portfolio

Training
- RFID Basic Training
- RFID Application Training
- RFID Hardware Training
- Standard EPCglobal Class1 Gen2
- CrossTalk BasicTraining
- CrossTalk Application Training
- IoT Application Training

R&D
- Antenna Development
- Transponder Development
- OEM Products

Test
- On-Site
- Off-Site
  (Kathrein-IoT Test & Application Center)

On-Site / Remote
- ReaderStart-Support
- Integration Test
- GoLive Support
Based on the embedded Linux OS, every RRU/ARU-reader offers the possibility for different interfaces. ProfiNET, Tag Blower and LLRP modules are available in the Kathrein download area. OPC UA is part of the CrossTalk integration layer. In addition, Kathrein offers full access for custom applications that can also be installed directly on the reader.
Best Product LogiMAT 2015

The winner in category „Identification, packing, loading, securing loads”: Kathrein Sachsen GmbH, Business Kathrein RFID with product „ARU-CSB-ELC“.

The revolutionary AUTO ID system ARU-CSB-ELC with automatic detection of direction.

By applying a good idea and a good concept, we could set on top in the category „Identification, packing, loading, securing loads“ and won the prize for „Best Product LogiMAT 2015“. The ARU-CSB RFID system enables for the first time a fully automatic detection of moving goods in the fields of industry and logistics. This provides the user with an adaptive RFID system, which transmits not only the product data but also the direction of the moved goods by using three selective reading zones.

Frost & Sullivan Award 2016

The winner in category „2016 European RFID in Logistics Product Line Strategy Leadership Award“.

Based on its recent analysis of the radio-frequency identification (RFID) market for logistics, Frost & Sullivan recognises Kathrein RFID with the 2016 European Frost & Sullivan Award for Product Line Strategy Award. Kathrein’s ultra-high frequency (UHF) RFID technology product portfolio, targeted at various end users ranging from commercial to industrial, enables end-to-end tracking in the logistics market. The company’s strategic acquisition of the software vendor noFilis further elevated Kathrein RFID’s position from that of a hardware vendor to a complete solution provider.

Kathrein RFID’s comprehensive product range was based on the company’s unique Kathrein RFID antenna interface (© KRAI). It introduced the © KRAI with the aim of enhancing the read range in dense transponder and reflective environments and facilitating the integration of RFID systems and reducing costs.