

CATALOG

# Identification and localization technologies

RFID and localization solutions – software – services



## Enabling Technologies for digital Transformation

From proof of concept (PoC) to go-live implementation, Kathrein Solutions supports its partners in the realization of turnkey projects in the areas of production and logistics, healthcare, automotive and intelligent transportation systems. By seamlessly integrating any identification and localization technologies such as RFID or wide area network technologies, we combine the most suitable features and

generate interfaces to all types of ERP systems and backends. We and our partners offer RF simulation, application support, software integration and implementation as well as operation and maintenance. First-class service, customer-oriented support and the development of customer-specific solutions round off our portfolio.

### KATHREIN STANDARD PORTFOLIO

#### > RAIN RFID readers

The RAIN RFID reader portfolio from Kathrein includes stationary 4-port RFID readers (RRU) and antenna-integrated readers (ARU). They offer USB or serial interfaces, high-end devices have powerful interfaces such as TCP/IP or wireless interfaces such as BLE, WiFi or 4G Mobile Interface. They are suitable for a wide range of applications.

#### > RAIN RFID antennas

Kathrein Solutions has a wide range of RAIN RFID antennas, which are divided into the PRO Line and the EDGE Line families. To enable a wide range of wireless identification applications, both antenna families contain devices with different reading widths and ranges. The robust PRO Line antennas are suitable for high mechanical stress and harsh environments.

#### > Software & services

For the identification and localization of goods, Kathrein offers its partners the opportunity to use existing software modules to create optimally tailored solutions for the end customer. In compliance with the highest standards, Kathrein also offers a high-quality portfolio of various services and support to seamlessly accompany partners and customers through the entire life cycle of their project.

### CUSTOMIZED SOLUTIONS

#### > Identification

To meet the unique requirements of our customers, Kathrein and its partners offer customized identification solutions tailored to specific circumstances and needs: from individually developed RFID systems for wireless identification to custom-built transponders. Our product range includes high-security transponders, windshield labels, headlamp tags and dual-frequency transponders that combine NFC and UHF technology.

#### > Localization

For reliable and accurate localization, even under the most demanding conditions, Kathrein relies on individually tailored new developments. The portfolio includes advanced wireless localization technologies, including RTLS (Real-Time Location Systems) and BLE (Bluetooth Low Energy), to effectively address a wide range of localization needs.

#### > Software

The software portfolio offers comprehensive support for individual solutions. These can be very complex, filtered event data with backend integration or even raw data push solutions, which are used to create customized, optimally fitting solutions for the end customer.

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## Our partner ecosystem

### ➤ Kathrein Solutions relies on partners

Companies that are currently driving forward the necessary digitalization of their processes in development, production and logistics are facing increasingly rapid pressure to change. At the same time, the requirements are becoming increasingly complex and comprehensive at all levels. Future-proof digitalization solutions require an intelligent combination of hardware, software and implementation services. A task that cannot possibly be performed by one expert alone. Based on this realization, the Kathrein partner ecosystem was

created. By combining a wide range of partner competencies with the Kathrein Solutions portfolio, a highly specialized, competent and powerful network is created that is ideally positioned for complex digitization projects. Customers benefit from the network of specialists and quickly available resources. Partners, in turn, benefit as part of the Kathrein network, partners benefit from access to the project business and professional support in the form of the Kathrein Partner Program.

### ➤ The partner program: optimally supported during all phases

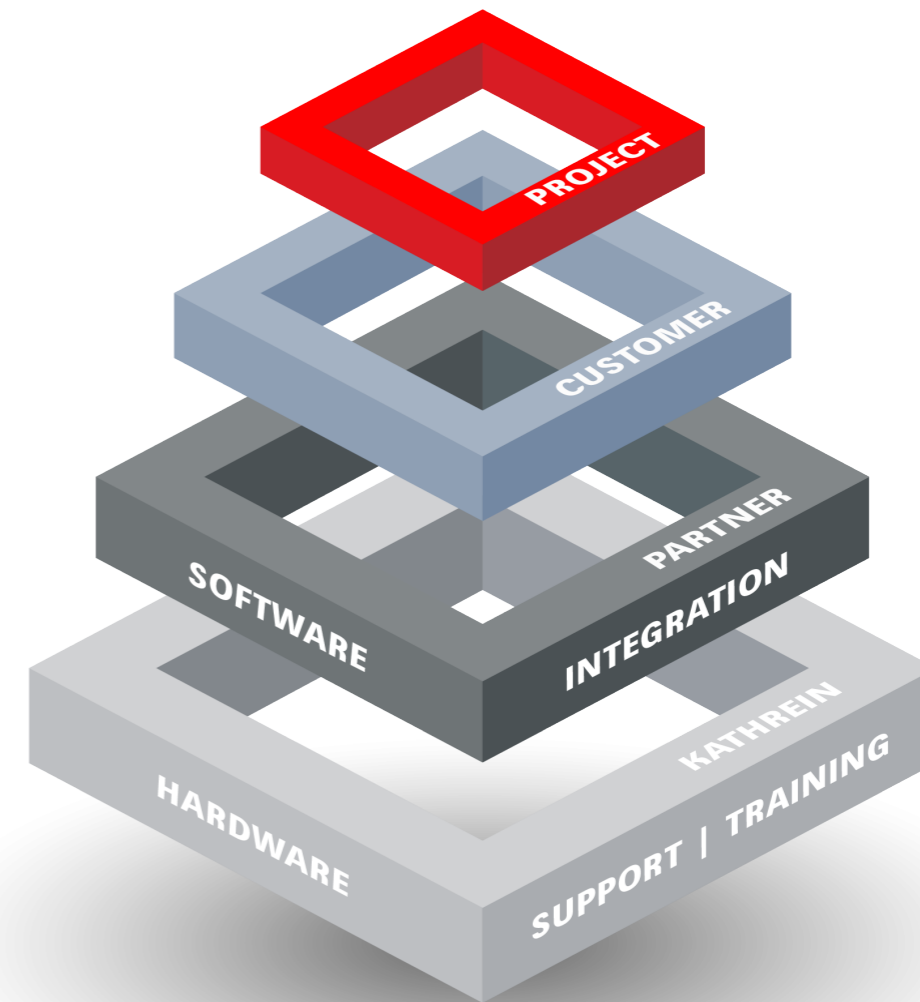


The partner program was designed for the optimal support of Kathrein partners and is continuously being further developed.

As a partner, we respond to your different needs:

- Distributors
- Process consultants
- System integrators
- Logistics specialists
- Solution partners for industry solutions

As a manufacturer, we provide you with the appropriate support for your project and customer requirements.



With its indirect sales approach, Kathrein Solutions focuses on a competent, global partner network of system integrators, resellers and technology partners. This partner ecosystem offers the necessary know-how and resources to implement holistic digitalization projects. The partners are individually supported in all project phases - from acquisition and proof of concept to roll-out at the customer's premises.

The wide range of conceptualization options based on the Kathrein Solutions portfolio and the extensive partner network is the basis for meeting all application requirements in the context of identification and localization projects.

### > Partner onboarding & training

We prepare you well for your presentation to the customer - in terms of sales and technology. In initial training courses at our Kathrein Training Academy, you will receive the necessary tools to convince the customer in the long term and to provide optimal advice. Our technical consulting training courses accompany you with basic, advanced or individual training courses - according to your needs and your desire to intensify the partnership. You can find out more about our training courses at Kathrein Training Academy on our website.

### > Marketing & sales services

Kathrein actively supports you with helpful marketing and sales tools during your acquisition phase. This includes both the mutual lead generation and a well-stocked knowledge base, which you can fall back on at any time. Our webinar and "up-to-date" newsletter series are just a few examples. For your customer presentations, we provide you with the appropriate demonstration equipment and invite you to join us at trade fairs.

Projects that have already been successfully implemented are the best advertising for you in the form of case studies. We write the success story together with you and with the customer's consent and publish it in the appropriate channels after consultation.

### > After-sales support

If service is required, the customer contacts your second level support. As a fall-back option, we are available to you manufacturer with short response times and our third level support team. Our repair service also ensures that components are replacement of components in the event of a problem. The end customer can therefore always rest assured that they will receive competent and prompt help at all times.

### > Support

You only have one chance to make a first impression. Your pitch to the customer needs to be well prepared and we are happy to support you in this. We will prepare the content of the meeting together, accompany you to the presentation if you wish, create an initial rough project concept and provide you with everything you need for the budget and quotation calculation. Even at this early stage, you will sense our enthusiasm for the future project.

### > Consulting

Even before the order is placed, we give you and the end customer the assurance that the project has been planned precisely. We are able to simulate the final solution set-up under real conditions in our in-house test center. In doing so, we not only check whether all RFID components work well together, and the way in which they need to be configured, but also take a close look at the relevant processes. Kathrein's consulting experts are at your side during this blueprint phase to minimize the project risk and ensure the success of its implementation. Of course, Kathrein also supports you during the exciting go-live phase.

### > Kathrein + partner = opportunities

Kathrein Solutions supports you throughout the entire sales, consulting, implementation, go-live and after-sales phase. Think of the Kathrein Solutions partner program as a toolbox that you can use according to your needs. You decide which tools you want to use and for how long in order to successfully implement your projects. New solutions have been created by combining our core competencies with those of our partners. For example, a replenishment control system for containers, an in-house pharmaceutical cold chain management system or a track & trace solution in the cloud.



Kathrein partners benefit from broad market access, first-class products and close-knit service. You can also rely on our partnership with:



## ➤ Successful together!

The Kathrein partner program is your enabler to discover and implement promising digitalization projects. Whether you find what you are looking for through targeted lead generation campaigns or through your own efforts, we equip you with the necessary tools to identify and successfully implement projects with your existing and potential new customers. Our range of solutions includes innovative applications such as optimizing the supply chain with eKanban systems in the automotive supply industry, implementing localization systems for transport containers or tracking and ensuring sustainable production processes. The market offers countless opportunities that we would like to exploit together with you. The areas of application are broad and range from manufacturing, logistics and healthcare to transportation. Benefit from our references in these sectors, which will make it much easier for you to gain access to customers.

## ➤ Take advantage of the Kathrein USPs:

The Kathrein Solutions USPs can be used as a complete portfolio or as individual components (build blocks). The modularity and partner-oriented approach offers maximum flexibility.

- Broad portfolio of RAIN RFID hardware
- BLE/UWB localization solutions
- Software
- Consulting & Support
- Test center for PoCs
- Virtual PoCs (simulations)
- Kathrein Training Academy
- Individual development



Kathrein supports you in the selection and configuration of suitable products for your customer project as well as during all subsequent project phases. As intense as you wish. From the first customer handshake to final acceptance and the subsequent support – you can rely on Kathrein.

## IoT solutions and applications

### ➤ Identification



#### Logistics

- Vehicle logistics
- Incoming goods / outgoing goods
- Floor conveyor systems



#### Manufacturing

- Assembly line
- eKanBan
- Small load carrier



#### Transportation

- ITS (identification, registration, tolling)
- Rail logistics
- Fleet management



#### Healthcare

- Locating medical devices
- Textile management
- Access control



#### Railway

- Vehicle identification / tracking
- Predictive maintenance
- Yard management



#### Access control

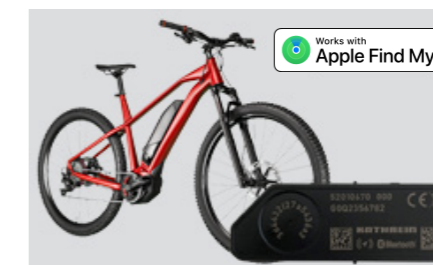
- Ski Gates
- Stadiums / Arenas
- Protected areas in companies

### ➤ Localisation



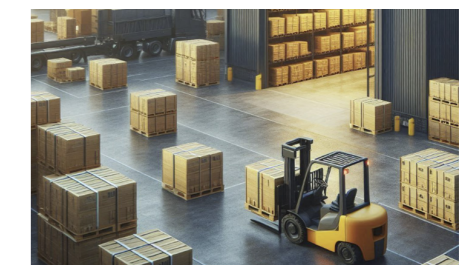
#### Asset Tracking

- Floor conveyor systems
- Medical devices



#### Customized Solutions

- Localization with e-bike tracker
- Based on Apple Find My network



#### Real-time localization

- Track & Trace
- Inventory management
- Security



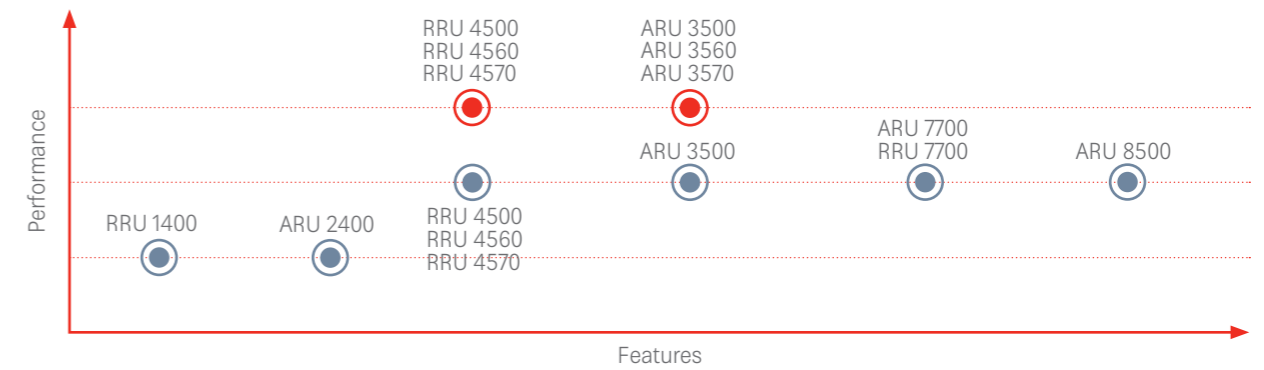
**NEW**



## RAIN RFID Gen4 readers

The **4th generation** of Kathrein RAIN RFID readers is based on experience and innovation. Our customers and partners can rely on the fact that the 4th generation is also SW-compatible, but at the same time new features and functions have been added that were previously missing on the market. Based on the Impinj Ex10 chipset, the Gen4 RFID readers are the most versatile and powerful devices for all IoT applications and harmonize with Kathrein's antenna series.

### > Reader overview and approvals



Reader	RRU 4500	RRU 4560	RRU 4570	ARU 3500	ARU 3560	ARU 3570
Order-No.	52010678	52010682	52010679	52010680	52010685	52010687
Country	52010684	52010681	52010685	52010686	52010687	52010688
EU 865 - 868 MHz	✓		✓	✓	✓	✓
EU 915 - 921 MHz	✓	✓	✓	✓	✓	✓
USA		✓	✓	✓	✓	✓

As of: 01/03/2025

- ✓ Country profile and certification in place.
- ✓ Country profile in place, certification pending.



► Features

<b>10x</b> higher RX sensitivity	<b>1100</b> tags / second	USB-C	52 % smaller footprint 66% smaller volume	
Smart Reader Mode	<b>40%</b> Lower power consumption than Gen3 Reader			
Multi port	<b>@KRAI</b> 10x higher switching speed	Web Interface	Linux	GNSS
<b>RRU</b> 4 Port RFID Reader Unit		Wi-Fi	Bluetooth SPP	<b>5G</b>
ARU with steerable antenna	Cyber Security	Scalable RFID performance based on the Impinj Ex 10 chip family		<b>IP68</b>

**Performance** – The 10 times higher sensitivity compared to the previous models and a reading rate of 1100 tags / second change the way identification works.

**@KRAI** – Kathrein RFID antenna interface @KRAI enables the control of up to 32 reading points with one reader and thus reduces the total cost of ownership (TCO).

**Robust** – the robust design and the high IP68 protection rating enable use in harsh environments without the need for an additional protective housing.

**Innovative** – The phased-array antenna technology integrated in the ARU Gen4 with three scalable antenna beams ensures highly reliable data acquisition - even in complex environments.

**Connectivity** – Flexible range of interfaces to reduce installation costs and easy adaptation to existing IT networks.

**GNSS** – The integrated GNSS receiver is available in versions with WLAN and 5G connectivity. It enables precise location determination in real time.



**RAIN RFID Technology: Your Way to a Successful Future!**

Kathrein Solutions passive UHF RFID Reader Hardware includes stationary reader and antennas with a read range from a few centimetres up to several meters. With those high end devices logistics, industrial automation, healthcare and vehicle identification applications can be covered.

Kathrein Solutions Reader Portfolio							
Type	RRU 1400	ARU 2400	ARU 3500 <sup>1)</sup>	RRU 4500 <sup>1)</sup>	ARU 7700	RRU 7700	ARU 8500
<b>Specifications</b>							
Air interface protocol	RAIN RFID / ISO 18000-63 and EPCglobal Gen2v2 compliant			RAIN RFID / ISO 18000-63 and EPCglobal Gen2v2 compliant			
Integrated antenna		1	1		1		3 (direction detection)
Ports for ext. antennas	4	3	3	4	3	4	3
Read zone with ©KRAI <sup>2)</sup>	32	25	-	32	-	32	-
Transmit power [max. dBm]	+30	+30	+33	+33	+33	+33	+33
Sensitivity [dBm]	typ. -80	typ. -70	typ. -93	typ. -93	typ. -80	typ. -80	typ. -80
Tag per-second	500	500	1000	1000	1000	1000	600
Processor speed	ARMv7-A based processor with 600 MHz			ARMv7-A based processor, 2 cores @ 800 MHz			
Flash memory eMMC [Mbyte]	4.000	4.000	8.000	8.000	8.000	8.000	8.000
RAM DDR2 [Mbyte]	128	128	1.000	1.000	1.000	1.000	1.000
Ethernet ports	1	1	2	2	2	2	2
GPIO - Input/output	2/2	2/2	4/4	4/4	4/4	4/4	4/4
LED visualisation	4	4	4 + 8	4 + 8	4 + 8	4 + 8	4
Degree of protection	IP40	IP40	IP68 <sup>3)</sup>	IP68 <sup>3)</sup>	IP67 <sup>3)</sup>	IP67 <sup>3)</sup>	IP40
Wireless interfaces			WiFi, BLE, 5G	WiFi, BLE, 5G			
<b>Key characteristics</b>							
RFID performance	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ □ □ □	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ □	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ □
Network & security	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ □ □
Connectivity	■ ■ ■ ■ □ □ □	■ ■ ■ ■ □ □ □	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ □ □	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ □ □
<b>Use case</b>							
Manufacturing and Automotive	✓	✓	✓	✓	✓	✓	
Logistics	✓	✓	✓	✓	✓	✓	✓
Track & Trace	✓	✓		✓		✓	✓
Intelligent Transportation Systems			✓	✓	✓	✓	
Healthcare	✓	✓		✓		✓	✓

<sup>1)</sup> Gen4 to Gen3 functionally identical

<sup>2)</sup> With the suitable ©KRAI Kathrein antennas, the readers with ©KRAI function allow polarization switching and SMSH cascading

<sup>3)</sup> If all connections are made with a Kathrein cable or with Kathrein protective caps



## > RRU 4500 Reader Serie

- 33 dBm / 2 W conducted power
- 4G/5G, WiFi, BLE, GNSS
- 4 TNC-R antenna connectors
- PoE
- Robust design
- @KRAI 1.0 / 2.0
- Dual Core Linux PC
- Protection class IP68 outdoor



Name	RRU 4500   RRU 4560   RRU 4570
Order number of ETSI version	52010678   52010679   52010680
Order number of FCC version*	52010682   52010683   52010684
Basic computer module	✓
Number of Ethernet connections	1
GPIO	✓
PoE+	✓
LED display	✓
@KRAI	✓

\*Suitable for application in the ETSI upper band range

### Accessories

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC Netzteil 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet switch, 4 connections
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injektor 30 W, 100 Mbit für RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010736	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

RFID UHF reader overview	ETSI Version	FCC Version
	RRU 4500	RRU 4500
Frequency range [MHz]	865-868   915-921 (ETSI upper band)	902-928
Max. TX power, conducted [dBm]	+33	
Max. RX sensitivity [dBm]	-93	
Max. read range <sup>1)</sup> [m]	32	
Max. write range <sup>1)</sup> [m]	22	
Max. read rate <sup>1)</sup> [tags/s]	1100	
Number of antenna connections [R-TNC]	4	
Operating system reader Linux	Linux	
Basic computer module	iMX7 ARM Cortex-A7 dual core @ 1200 MHz	
@KRAI	1.0 / 2.0	
Interfaces		
Number of Ethernet connections	1	
GPIO	✓	
PoE	PoE according to 802.3at (10-57)	
LED display		
Power LED / freely programmable LEDs	1/7	
Mechanic properties		
Operating temperature range [°C]	-40 to +60	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x B x H) [mm]	160 x 270 x 50	
Protection class	IP68	
Standards	ISO 18000-6C EPC Gen2 V2 UCODE DNA EN 29167-10 ETSI reader: EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529, FCC reader: FCC Part15, UL, IC	

<sup>1)</sup> If all connections are made with a Kathrein cable or have Kathrein protective caps



## ➤ ARU 3500 Reader Serie

- 33 dBm / 2 W conducted power
- 3 external antenna connectors
- 1 internal steerable antenna
- Dual Core Linux PC
- 4G/5G, WiFi, BLE, GNSS
- PoE
- @KRAI 1.0 / 2.0
- Protection class IP68 outdoor



Name	ARU 3500   ARU 3560   ARU 3570
Order number of ETSI version	52010681   52010686   52010688
Order number of FCC version*	52010685   52010687   52010689
Basic computer module	✓
Number of Ethernet connections	1
GPIO	✓
PoE+	✓
LED display	✓
@KRAI	✓

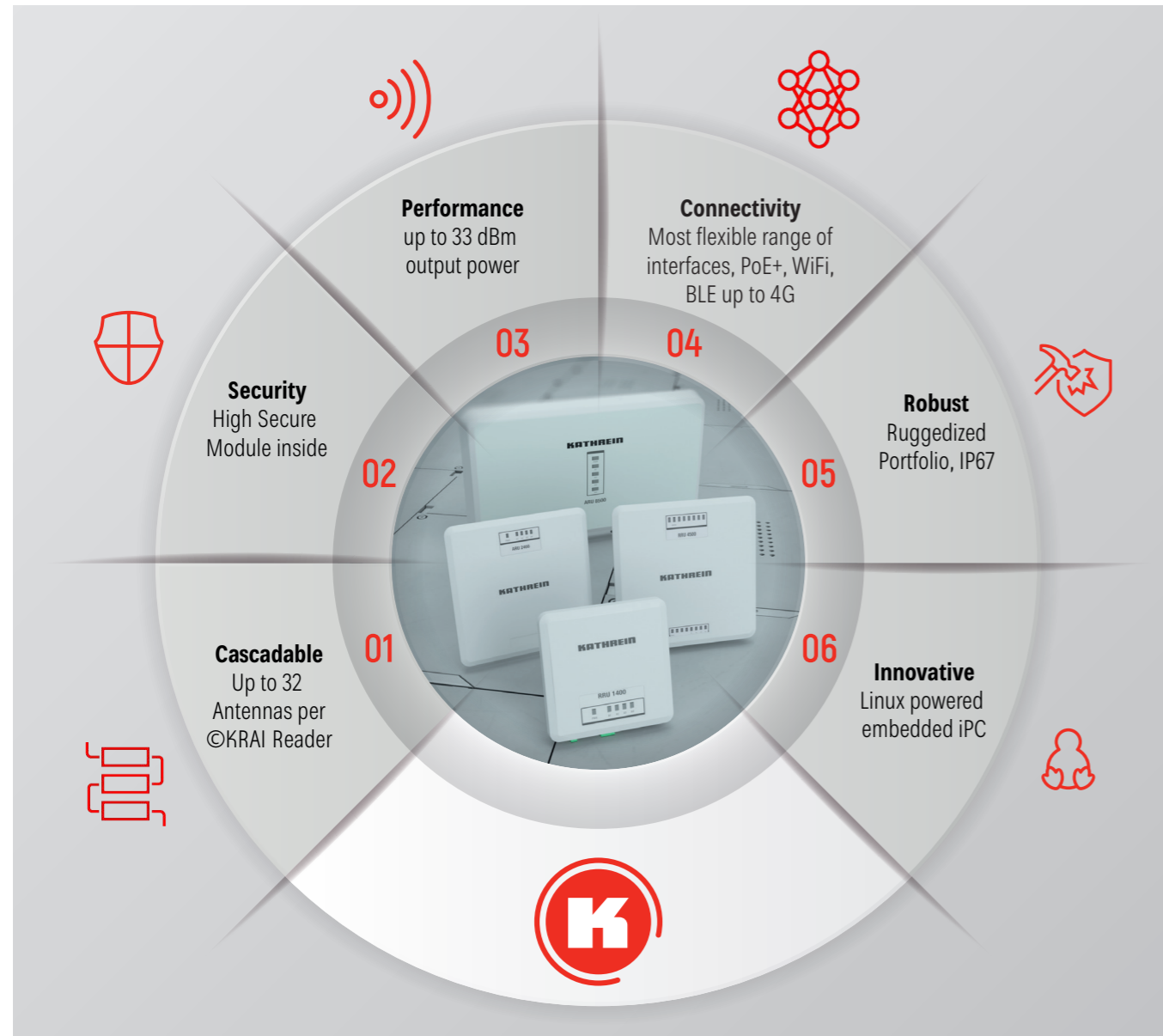
\*Suitable for application in the ETSI upper band range

### Accessories

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
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52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC Netzteil 24 V/90 W DIN rail
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52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010736	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

RFID UHF reader overview	ETSI Version	FCC Version
	RRU 4500	RRU 4500
Frequency range [MHz]	865-868   915-921 (ETSI upper band)	902-928
Max. TX power, conducted [dBm]	+33	
Max. RX sensitivity [dBm]	-93	
Max. read range <sup>1)</sup> [m]	32	
Max. write range <sup>1)</sup> [m]	22	
Max. read rate <sup>1)</sup> [tags/s]	1100	
Number of antenna connections [R-TNC]	4	
Operating system reader Linux	Linux	
Basic computer module	iMX7 ARM Cortex-A7 dual core @ 1200 MHz	
@KRAI	1.0 / 2.0	
Interfaces		
Number of Ethernet connections	1	
GPIO	✓	
PoE	PoE according to 802.3at (10-57)	
Integration of the antenna		
Half-power beam width [°]	65	
Beam steering angle [°] Left   Middle   Right	-20   0   +20	
Antenna gain, RHCP [dBiC]	6.0   7.0   6.0	
LED display		
Power LED / freely programmable LEDs	1/7	
Mechanic properties		
Operating temperature range [°C]	-40 to +60	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x B x H) [mm]	160 x 270 x 50	
Protection class	IP68	

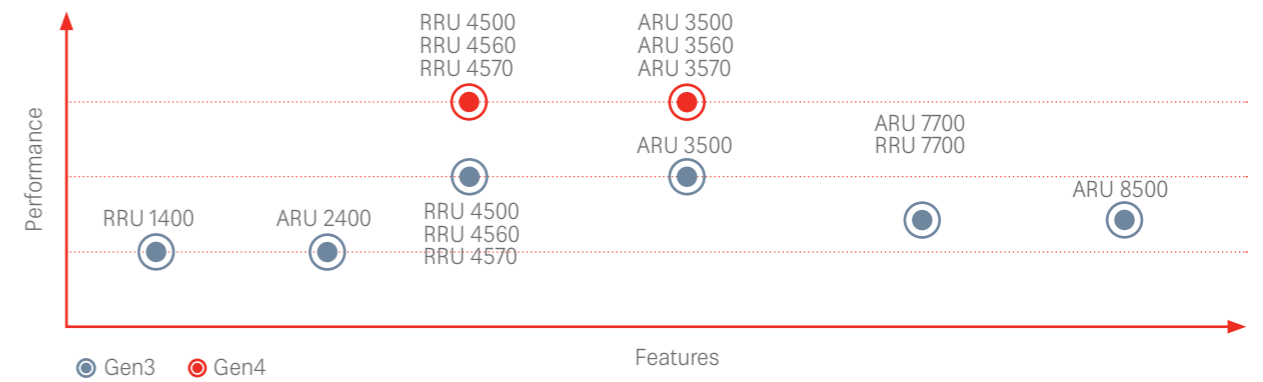
<sup>1)</sup> If all connections are made with a Kathrein cable or have Kathrein protective caps



## RAIN RFID Gen3 readers

Kathrein Solutions passive UHF RFID readers of **3rd generation**, which meet ISO 18000-6C, impress with their first-class reading performance, flexibility, powerful Linux operating systems and IP protection classes suitable for a wide range of applications.

### Reader overview and approvals



Reader	RRU 1400	RRU 4500	RRU 4560	RRU 4570	ARU 2400	ARU 3500	ARU 8500											
Order-No.	52010551	52010552	52010585	52010288	52010296	52010454	52010536	52010698	52010289	52010297	52010290	52010298	52010348	52010349	52010537	52010292	52010300	52010340
Country																		
Australia	✓																	
Argentina					✓													
Brazil	✓				✓													
Canada	✓				✓													
China						✓												
EU 865 - 868 MHz	✓			✓					✓		✓		✓			✓		✓
EU 915 - 921 MHz	✓				✓					✓		✓		✓		✓		
Guatemala 902 - 906 MHz		✓																
Guatemala 918 - 923 MHz		✓																
India <sup>1)</sup> 865 - 867 MHz	✓			✓					✓		✓		✓			✓		✓
Indonesia	✓				✓													
Japan	✓																	
Mexico	✓																	
Morocco	✓			✓												✓		✓
Peru		✓			✓													
Russia <sup>2)</sup> 866 - 868 MHz	✓			✓					✓		✓		✓			✓		✓
Saudi Arabia	✓			✓														
Singapore			✓		✓												✓	
South Africa 865 - 868 MHz	✓			✓														
South Africa 915 - 919 MHz		✓			✓													
South Korea		✓			✓													
Thailand		✓			✓													
Turkey <sup>2)</sup>	✓			✓					✓		✓		✓			✓		✓
USA	✓			✓					✓		✓		✓			✓		✓
Vietnam		✓			✓													

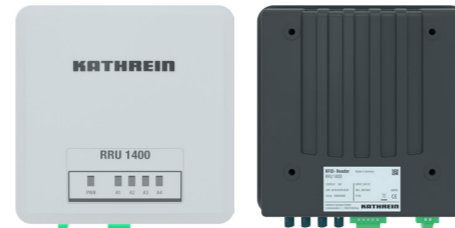
As of: 01/09/2024

✓ Country profile and certification in place.  
 ✓ Country profile in place, certification pending.  
 1) Import via local dealer.  
 2) License from local company required.



## > RRU 1400 reader series

- 30 dBm/1 W conducted power
- Up to 33 dBm ERP/2 W ERP
- FAKRA/SMA antenna connections
- @KRAI
- Protection class IP40
- Small form factor
- Basic computer module



Name	RRU 1400
Order number of ETSI version	52010551 (FAKRA)   52010719 (SMA)
Order number of FCC version*	52010552 (FAKRA)   52010720 (SMA)
Basic computer module	✓
Number of Ethernet connections	1
GPIO	✓
PoE+	✓
LED display	✓
©KRAI	✓

\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA	52010727	0,5 m RFID antenna cable, SMA-SMA
52010452	3 m RFID antenna cable, SMA-FAKRA	52010728	1 m RFID antenna cable, SMA-SMA
52010453	5 m RFID antenna cable, SMA-FAKRA	52010729	3 m RFID antenna cable, SMA-SMA
52010461	1 m RFID antenna cable, TNC-FAKRA	52010730	5 m RFID antenna cable, SMA-SMA
52010462	3 m RFID antenna cable, TNC-FAKRA	52010738	1 m RFID antenna cable, TNC-SMA
52010463	5 m RFID antenna cable, TNC-FAKRA	52010739	3 m RFID antenna cable, TNC-SMA
52010485	0,5 m RFID antenna cable, FAKRA-FAKRA	52010740	5 m RFID antenna cable, TNC-SMA
52010486	1 m RFID antenna cable, FAKRA-FAKRA	52010474	R-RPA 24VDC-18W, AC/DC power supply unit
52010487	3 m RFID antenna cable, FAKRA-FAKRA	52010351	Wall mount kit outdoor
52010488	5 m RFID antenna cable, FAKRA-FAKRA	52010736	Wall mount kit indoor

## > RRU 1400 reader overview

RFID UHF reader Overview	ETSI version	FCC version
	RRU 1400	RRU 1400
Frequency range [MHz]	865-868   915-921 (ETSI upper band)	902-928
Max. TX power, conducted [dBm]	+30	
Number of FAKRA antenna connections	4	
Operating system reader	Linux	
Basic computer module	ARMv7-A based processor with 600 MHz	
©KRAI	✓	
Interface		
Number of Ethernet connections	1	
GPIO	✓	
PoE+	PoE+ according to 802.3at (10-57)	
LED display, freely programmable		
Basic LEDs	4	
Mechanical properties		
Operating temperature range [°C]	-20 to +55	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x W x H) [mm]	167 x 167 x 40	
Protection class	IP40	
Standards	EPC Gen2 V2, UCODE DNA	
	FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529	



## ➤ ARU 2400 reader series

- 30 dBm/2 W conducted power
- Up to 33 dBm ERP/2 W ERP\*
- FAKRA/SMA antenna connections
- Protection class IP40
- PoE+
- @KRAI
- Basic computer module



Name	ARU 2400 ETSI   ARU 2401 FCC
Order number of ETSI version	52010348 (FAKRA)   52010721 (SMA)
Order number of FCC version**	52010664 (FAKRA)   52010722 (SMA)
Basic computer module	✓
Number of Ethernet connections	1
GPIO	✓
LED display	✓
PoE	✓
@KRAI	✓

\* With external antennas \*\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA	52010479	MK-SHM-4P Mounting kit for shelf mounting
52010452	3 m RFID antenna cable, SMA-FAKRA	52010727	0,5 m RFID antenna cable, SMA-SMA
52010453	5 m RFID antenna cable, SMA-FAKRA	52010728	1 m RFID antenna cable, SMA-SMA
52010461	1 m RFID antenna cable, TNC-FAKRA	52010729	3 m RFID antenna cable, SMA-SMA
52010462	3 m RFID antenna cable, TNC-FAKRA	52010730	5 m RFID antenna cable, SMA-SMA
52010463	5 m RFID antenna cable, TNC-FAKRA	52010738	1 m RFID antenna cable, TNC-SMA
52010485	0,5 m RFID antenna cable, FAKRA-FAKRA	52010739	3 m RFID antenna cable, TNC-SMA
52010486	1 m RFID antenna cable, FAKRA-FAKRA	52010740	5 m RFID antenna cable, TNC-SMA
52010487	3 m RFID antenna cable, FAKRA-FAKRA	52010474	R-RPA 24VDC-18W, AC/DC power supply unit
52010488	5 m RFID antenna cable, FAKRA-FAKRA	52010351	Wall mount kit outdoor
		52010736	Wall mount kit indoor

## ➤ ARU 2400 reader overview

RFID UHF reader overview	ETSI version	FCC version
	ARU 2400	ARU 2401
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power conducted [dBm]	+30	
Max. TX power radiated [dBm] int. antenna	+30,25	+32,5
Protocol	EPC Class1 Gen2V2/ISO 18000-6C	
Number of antenna connections	3 FAKRA plugs, Z-coded or 3 SMA sockets	
Operating system reader	Linux	
Basic computer module	ARMv7-A based processor with 600 MHz	
@KRAI	✓	
<b>Integration of the antenna</b>		
Half-power beam width [°]	60	
Gain, circular [dBiC]	typ. 5.5	
<b>Interface</b>		
Ethernet	1	
PoE	PoE Class 0 according to 802.3at (10-57)	
GPIO	2 inputs, 2 outputs	
LED display, freely programmable	4 basic LEDs	
<b>Mechanical properties</b>		
Operating temperature range [°C]	-20 to +55	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x W x H) [mm]	300 x 300 x 49	
Protection class	IP40	
Standards	EPC Gen2 V2, UCODE DNA	
	FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529	



## ARU 3500 reader series

- 33 dBm/2 W conducted power
- Up to 36 dBm ERP/4 W ERP\*
- Integrated 65° antenna
- Robust Design
- Protection class IP67
- Dual Core Linux PC
- PoE+



Name	ARU 3500
Order number of ETSI version	52010292
Order number of FCC version**	52010300
Integrated industrial PC with dual core CPU	✓
Number of Ethernet connections	2
GPIO	✓
LED display	✓
PoE+	✓

\* With external antennas \*\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet Switch, 4-port
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

## ARU 3500 reader overview

RFID UHF reader overview	ETSI version	FCC version
	ARU 3500	ARU 3500
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power, conducted [dBm]	+33	+30 (+33 with extended cable length)
Max. TX power radiated [dBm] int. antenna	+33 ERP	+36 EIRP
Protocol	EPC Class1 Gen2/ISO 18000-6C	
Number of antenna connections [R-TNC]	3	
Operating system reader	Linux	
Integrated industrial PC	dual core @ 800 MHz/8 GB/Linux OS	
Interfaces		
Number of Ethernet connections	2	
PoE+	PoE+ according to 802.3at (10-57)	
GPIO	4 inputs/4 outputs	
Integration of the antenna		
Half-power beam width [°]	65°	
Antenna gain [dBiC]	8,5	
LED display, freely programmable		
Basic LEDs	4	
High-end LEDs	8	
Mechanical properties		
Operating temperature range [°C]	-20 to +55	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x W x H) [mm]	300 x 300 x 71	
Protection class	IP67*	
Standards		
	EPC Gen2 V2, UCODE DNA	FCC Part15, UL, IC, EPC Gen2 V2, UCODE DNA, ISO/IEC 18000-63:2021 Type C, ISO/IEC 18000-64:2012 Type D

\* If all connections are made with a Kathrein cable or have Kathrein protective caps



## > RRU 4500 reader series

- 33 dBm/2 W conducted power
- Up to 36 dBm ERP/4 W ERP
- Robust design
- Protection class IP67
- Dual-core Linux PC
- PoE+
- ©KRAI
- 2G/3G/4G, WIFI, BLE optional



Name	RRU 4500	RRU 4560	RRU 4570
Order number of ETSI version	52010288	52010289	52010290
Order number of FCC version*	52010296	52010297	52010298
Integrated industrial PC with dual core CPU	✓	✓	✓
Number of Ethernet connections	2	2	2
GPIO	✓	✓	✓
©KRAI	✓	✓	✓
PoE+	✓	✓	✓
LED display	✓	✓	✓
WLAN		✓	
Bluetooth		✓	
2G/3G/4G			✓

\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet switch, 4 connections
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

## > RRU 4500 reader overview

RFID UHF reader overview	ETSI version	FCC version
	RRU 45xx	RRU 45xx
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power, conducted [dBm]	+33	+30 (+33 with extended cable length)
Protocol	EPC Class1 Gen2/ISO 18000-6C	
Number of antenna connections [R-TNC]	4	
Operating system reader	Linux	
Basic computer module	✓	✓
Integrated industrial PC	dual core @ 800 MHz/8 GB/Linux OS	dual core @ 800 MHz/8 GB/Linux OS
©KRAI	✓	✓
Interfaces		
Number of Ethernet connections	2	2
WLAN	RRU 4560	RRU 4560
Bluetooth	RRU 4560	RRU 4560
2G/3G/4G	RRU 4570	RRU 4570
PoE+	PoE+ according to 802.3at (10-57)	
GPIO	4 inputs/4 outputs	
LED display, freely programmable		
Basic LEDs	4	
High-end LEDs	8	
Mechanical properties		
Operating temperature range [°C]	-20 to +55	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x W x H) [mm]	300 x 300 x 71	
Protection class	IP67*	
Standards	EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529, EPC Gen2 V2, UCODE DNA, ISO/IEC 18000-64:2012 Type D	FCC Part15, UL, IC, EPC Gen2 V2, UCODE DNA, ISO/IEC 18000-64:2012 Type D

\* If all connections are made with a Kathrein cable or have Kathrein protective caps



## RRU 7700 reader series

- 33 dBm/2 W conducted power
- Up to 36 dBm ERP/4 W ERP
- Crypto suite conform
- Built-in high secure memory module
- Dual core Linux CPU
- PoE+; ©KRAI
- Robust design
- Protection class IP67



Name	RRU 7700
Order number of ETSI version	52010592
Order number of FCC version*	52010594
Integrated industrial PC with Dual Core CPU	✓
Built-in high security memory (HSM) module	✓
Crypto suite conform	✓
Number of Ethernet connections	2
GPIO	✓
©KRAI	✓
PoE+	✓
LED display	✓

\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet Switch, 4-port
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable TNC/TNCR	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable TNC/TNCR		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

## RRU 7700 reader overview

RFID UHF reader overview	ETSI version	FCC version
	RRU 7700	RRU 7700
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power, conducted [dBm]	+33	+30 (+33 with extended cable length)
Protocol	EPC Class1 Gen2/ISO 18000-6C	
Number of antenna connections [R-TNC]	4	
Operating system reader	Linux	
Basic computer module	✓	
Integrated industrial PC	dual-core @ 800 MHz/8 GB/Linux OS	
@KRAI	✓	
Interfaces		
Number of Ethernet connections	2	
PoE+	PoE+ according to 802.3at (10-57)	
GPIO	4 inputs/4 outputs	
LED display, freely programmable		
Basic LEDs	4	
High-end LEDs	8	
Mechanical properties		
Operating temperature range [°C]	-20 to + 55	
Storage temperature range [°C]	-40 to + 85	
Dimensions (L x W x H) [mm]	300 x 300 x 71	
Protection class	IP67*	
Standards		
Crypto standards	ISO/IEC 29167-10 ISO/IEC 18046-2 ISO/IEC 18047-6	
Standards for the HF interface	EPC Gen2 V2, UCODE DNA	
	FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529	

\* If all connections are made with a Kathrein cable or have Kathrein protective caps



## > ARU 7700 reader series

- 33 dBm/2 W conducted power
- Up to 36 dBm ERP/4 W ERP\*
- Crypto suite conform
- Integrated 65° antenna
- Dual core Linux CPU
- PoE+
- Robust design
- Protection class IP67



Name	ARU 7700
Order number of ETSI version	52010593
Order number of FCC version*	52010595
Integrated industrial PC with dual core CPU	✓
Built-in high security memory (HSM) module	✓
Crypto suite conform	✓
Number of Ethernet connections	2
GPIO	✓
PoE+	✓
LED display	✓

\* Suitable for application in the ETSI upper band range

### Accessoires

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet switch, 4-port
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable TNC/TNCR	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable TNC/TNCR		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

## > ARU 7700 reader overview

RFID UHF reader overview	ETSI version	FCC version
	ARU 7700	ARU 7700
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power conducted [dBm]	+33	+30 (+33 with extended cable length)
Protocol	EPC Class1 Gen2/ISO 18000-6C	
Number of antenna connections [R-TNC]	3	
Operating system reader	Linux	
Basic computer module	✓	
Integrated industrial PC	dual core @ 800 MHz/8 GB/Linux OS	
Interfaces		
Number of Ethernet connections	2	
PoE+	PoE+ according to 802.3at (10-57)	
GPIO	4 inputs/4 outputs	
Integration of the antenna		
Half-power beam width [°]	65	
Antenna gain [dBiC]	8.5	
LED display, freely programmable		
Basic LEDs	4	
High-end LEDs	8	
Mechanical properties		
Operating temperature range [°C]	-20 to + 55	
Storage temperature range [°C]	-40 to + 85	
Dimensions (L x W x H) [mm]	300 x 300 x 71	
Protection class	IP67*	
Standards		
Crypto standards	ISO/IEC 29167-10 ISO/IEC 18046-2 ISO/IEC 18047-6	
Standards for the HF interface	EPC Gen2 V2, UCODE DNA FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529	

\* If all connections are made with a Kathrein cable or have Kathrein protective caps



**RRU 7800 reader series**

- 33 dBm/2 W conducted power
- Up to 36 dBm ERP/4 W ERP
- Crypto suite conform
- Built-in high secure memory module
- Dual core Linux CPU
- PoE+; ©KRAI
- Robust design
- Protection class IP67



Name	RRU 7800
<b>Order number of ETSI version</b>	<b>52010716</b>
Integrated industrial PC with Dual Core CPU	✓
Built-in high security memory (HSM) module HSM II	✓
Crypto suite conform	✓
Number of Ethernet connections	2
GPIO	✓
©KRAI	✓
PoE+	✓
LED display	✓

**Accessoires**

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet Switch, 4-port
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet connection cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU
52010174	3 m low-loss 240 antenna cable TNC/TNCR	52010376	Protective caps for RRU 4xxx, ARU 3xxx
52010175	6 m low-loss 240 antenna cable TNC/TNCR		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

**RRU 7800 reader overview**

RFID UHF reader overview	Brazil version
	RRU 7800
Frequency range [MHz]	902-907   915-928
Max. TX power, conducted [dBm]	+30
Protocol	EPC Class1 Gen2/ISO 18000-6C
Number of antenna connections [R-TNC]	4
Operating system reader	Linux
Basic computer module	✓
Integrated industrial PC	dual-core @ 800 MHz/8 GB/Linux OS
@KRAI	✓
<b>Interfaces</b>	
Number of Ethernet connections	2
PoE+	PoE+ according to 802.3at (10-57)
GPIO	4 inputs/4 outputs
<b>LED display, freely programmable</b>	
Basic LEDs	4
High-end LEDs	8
<b>Mechanical properties</b>	
Operating temperature range [°C]	-20 to + 65
Storage temperature range [°C]	-40 to + 85
Dimensions (L x W x H) [mm]	300 x 300 x 71
Protection class	IP67*
<b>Standards</b>	
Crypto standards	ISO/IEC 29167-10 ISO/IEC 18046-2 ISO/IEC 18047-6
Standards for the HF interface	EPC Gen2 V2, UCODE DNA
	FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529

\* If all connections are made with a Kathrein cable or have Kathrein protective caps



### > ARU 8500 reader series

- 33 dBm/2 W conducted power
- Direction recognition by integrated switch-beam antenna
- Up to 36 dBm ERP/4 W ERP\*
- IP40
- Dual core Linux PC
- 3 other external antenna connectors



Name	ARU 8500
Order number of ETSI version	52010340
Order number of FCC version**	52010341
Integrated industrial PC with dual core CPU	✓
Number of Ethernet connections	2
GPIO	✓
LED display	✓
PoE+	✓
Antenna system	Phased array antennas with 3 reading zones

\* For external antennas \*\* Suitable for application in the ETSI upper band range

#### Accessoires

Order number	Description	Order number	Description
52010358	10 m RRU/ARU DC power cable	52010364	RRU/ARU AC/DC power supply unit 24 V/90 W
52010359	3 m RRU/ARU DC power cable	52010365	RRU/ARU AC/DC power supply unit 24 V/72 W DIN rail
52010360	10 m RRU/ARU Ethernet cable M12/RJ45	52010366	RRU/ARU AC/DC power supply unit 24 V/90 W DIN rail
52010361	3 m RRU/ARU Ethernet cable M12/RJ45	52010369	PoE+ Ethernet switch, 4-port
52010362	10 m RRU/ARU GPIO cable M12	52010370	PoE+ injector 30 W, 100 Mbit for RRU, ARU
52010363	3 m RRU/ARU GPIO cable M12	52010351	Outdoor wall bracket
52010373	10 m RRU/ARU Ethernet bridge cable	52010261	Indoor wall bracket
52010694	1,5 m low-loss 240 antenna cable	52010367	Vandalism protection for RRU, ARU, WRA 70
52010174	3 m low-loss 240 antenna cable	52010376	Protective caps for RRU, ARU
52010175	6 m low-loss 240 antenna cable		
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		

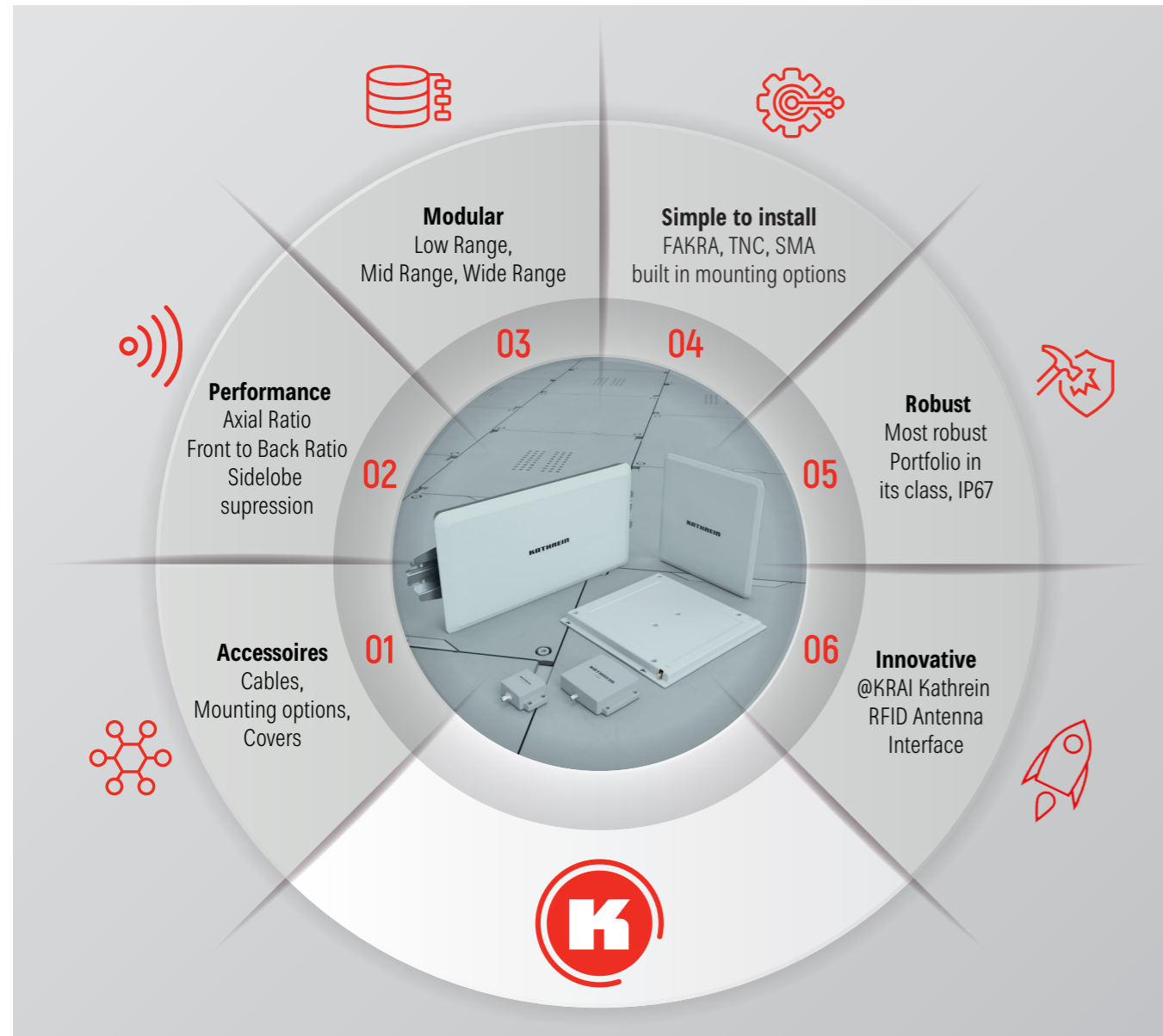
### > ARU 8500 reader overview

Frost & Sullivan awarded Kathreins ARU8500 with the 2020 Best Practices Award for the “European RFID Reader in Manufacturing and Logistics New Products Innovation”.

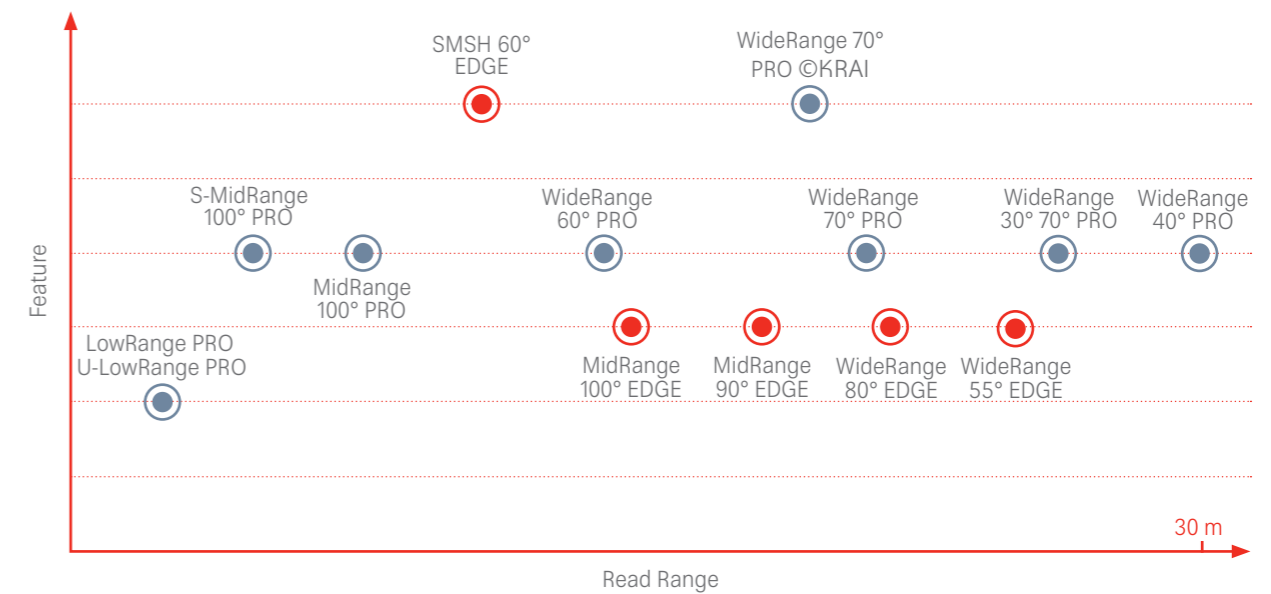
With its 30° antenna and dynamic reading zones, the ARU8500 reader facilitates direction detection of

moving goods. 3 additional antenna connectors mean that it offers the highest precision even in industrial environments. It is therefore the perfect solution for incoming and outgoing goods, anti-theft monitoring in retail, asset tracking and many other logistics applications.

RFID UHF reader overview	ETSI version	FCC version
	ARU 8500	ARU 8500
Frequency range [MHz]	865-868	902-928   915-921 (ETSI upper band)
Max. TX power radiated [dBm]	+33	+30 (+33 with extended Kabel length)
Max. TX power radiated [dBm] int. antenna	+33 ERP	+36 EIRP
Protocol	EPC Class1 Gen2/ISO 18000-6C	
Number of antenna connections	6 (3 = left/middle/right + 3 ext. R-TNC)	
Operating system reader	Linux	
Basic computer module	✓	
Integrated industrial PC	dual core @ 800 MHz/8 GB/Linux OS	
Integration of the antenna		
Half-power beam width [°]	30 vertical/80 horizontal	
Gain left / middle / right [dBiC]	7.0/8.0/7.0	
Deflection of the detection areas	+35/0/-35	
Polarization	circular	
Interface		
Ethernet	2	
PoE+	PoE+ according to 802.3at (10–57)	
GPIO	4 inputs/4 outputs	
LED display, freely programmable	4 basic LEDs	
Mechanical properties		
Operating temperature range [°C]	-20 to +55	
Storage temperature range [°C]	-40 to +85	
Dimensions (L x W x H) [mm]	656 x 362 x 112	
Protection class	IP40	
Standards	EPC Gen2 V2, UCODE DNA	
	FCC Part15, UL, IC, EN302208-2 V2.1.1, EN301489-3, EN50364, EN62368-1, EN60529	

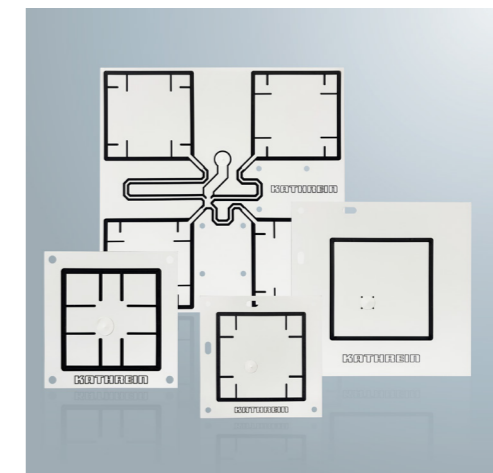


> Antenna overview



● PRO Line

● EDGE Line



## RAIN RFID antennas

Kathrein Solution's passive RAIN RFID antennas are divided into the PRO Line and the EDGE Line family. In order to be able to react flexibly to the most diverse applications in wireless identification, both antenna families contain devices with different reading widths and ranges. Suitable for a variety of different applications with read ranges from a few centimetres up to 30 meters, the portfolio always offers the right component.

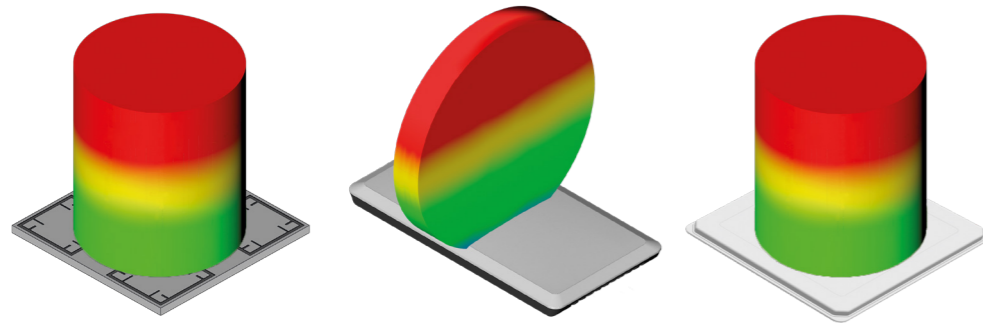


> Antenna radiation pattern

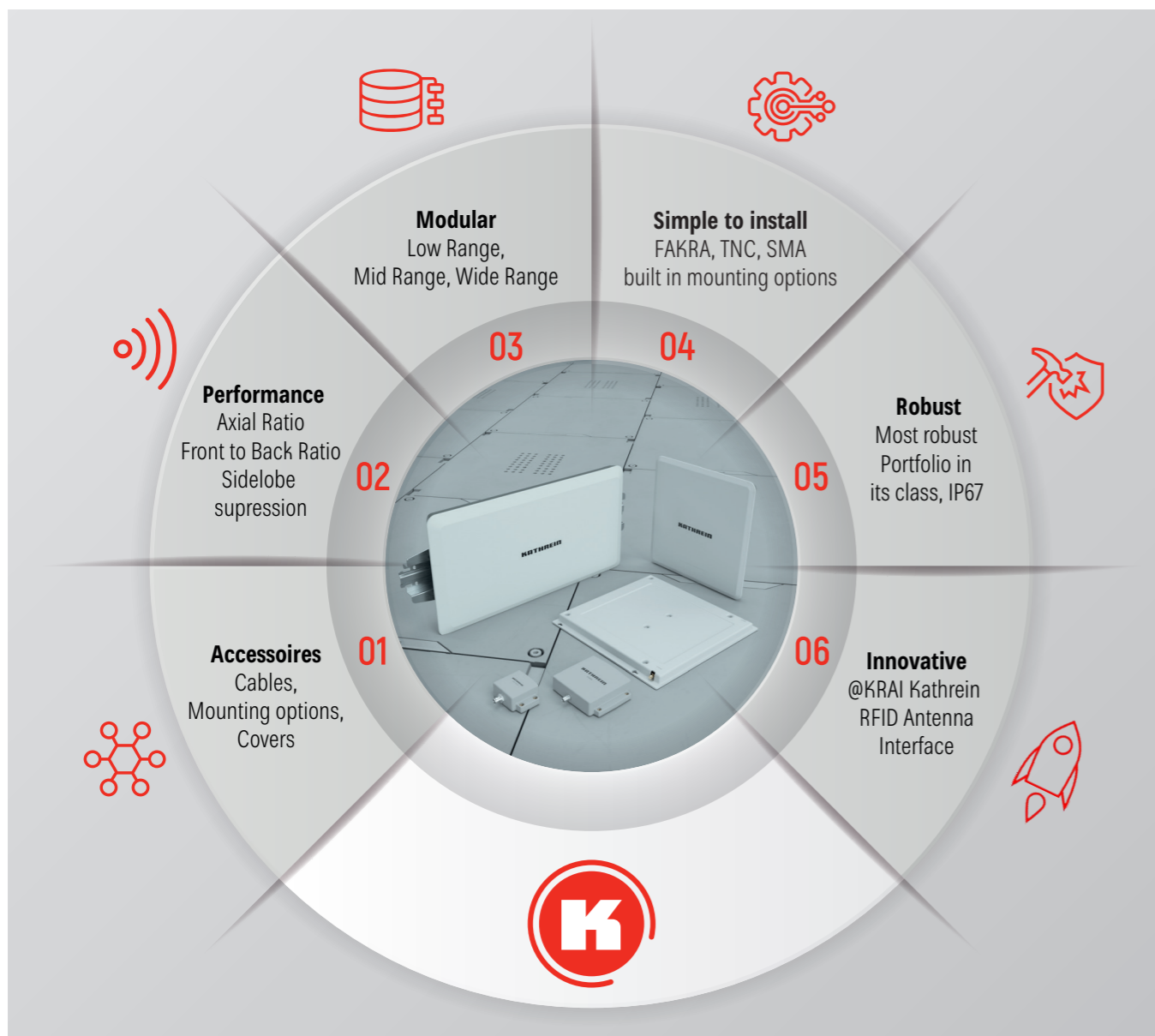


Ultra Low Gain	Low Gain	Mid Gain	Mid Gain
<b>U-LowRange PRO</b> <b>LowRange PRO</b>	<b>S-MidRange 100° PRO</b> <b>MidRange 100° PRO</b>	<b>SmartShelf 60° EDGE</b> <b>SmartShelf 60° ©KRAI EDGE</b>	<b>WideRange 60° PRO</b>
ETSI/FCC:52010092 ETSI: 52010084 FCC: 52010085	ETSI/FCC: 52010172 ETSI: 52010082 FCC: 52010083	ETSI: 52010523 FCC: 52010525 ETSI: 52010524 FCC: 52010526	ETSI: 52010423 FCC: 52010424
Gain			
-30 dBiC -15 dBiC	-12 dBiC 2.5 dBiC	4 dBiC 3 dBiC	5.5 dBiC
Beamwidth			
n.a.	100°/100°	60°/60°	60°/60°
Read Range			
< 0.1 m < 0.1 m	0 - 1 m 0 - 2 m	0 - 3 m 0 - 3 m	0 - 5 m
Polarization			
-	RHCP	RHCP	RHCP
Protection class			
IP67	IP67	IP40	IP67
Characteristics			
Proximity	Radiated near field	Clearly defined read zone	Focused read zone
Near field tags	Interference resistant (SMidRange)	Easy to integrate	Robust reading
Tap and go		Cascadable (©KRAI)	
Applications			
Access control	Access control	eKanban / smart shelf	Smart shelf
Smart cabinet	Conveyor belt	Smart cabinet	Conveyor belt
Payment readpoints		Smart desk / PoS	

Mid Gain	Mid Gain	High Gain	High Gain
<b>MidRange 100° EDGE</b>	<b>MidRange 90° EDGE</b>	<b>WideRange 80° EDGE</b>	<b>WideRange 70° PRO</b> <b>WideRange 70° ©KRAI PRO</b>
ETSI: 52010723	ETSI: 52010710 FCC: 52010711	ETSI: 52010725 FCC: 52010726	ETSI: 52010333 FCC: 52010334 ETSI: 52010335 FCC: 52010336
Gain			
5 dBiC	6.5 dBiC	7.5 dBiC	8.5 dBiC 6.5 dBiC / 7 dBi
Beamwidth			
100°/100°	< 90° / < 90°	80°/80°	70°/70°
Read Range			
0 - 5 m	0 - 8 m	0 - 10 m	0 - 10 m
Polarization			
RHCP	RHCP	RHCP	RHCP RHCP/LHCP/LH/LV
Protection class			
IP40	IP40	IP54	IP67
Characteristics			
High efficient	High efficient	High efficient	Outdoor-Anwendung
Small footprint	Small footprint	Small footprint	Feldoptimierung ©KRAI
Easy to integrate	Easy to integrate	Easy to integrate	LED-Visualisierung ©KRAI
Applications			
Smart shelf	Smart shelf	Dock door	Dock door
Conveyor belt	Conveyor belt	Track & Trace	Track & Trace
Smart cabinet	Smart cabinet	Access control	Vehicle & train identification
Smart desk / PoS	Smart desk / PoS	RFID tunnel	Tolling plaza
			Parking



High Gain	High Gain	High Gain
WideRange 55° EDGE	WideRange 30° 70 PRO	WideRange 40° PRO
ETSI: 52010712 FCC: 52010713	ETSI: 52010583 FCC: 52010584	ETSI: 52010251 FCC: 52010552
Gain		
10 dBiC	11.5 dBiC	12.5 dBi
Beamwidth		
55°/55°	30°/70°	40°/40°
Read range		
0 - 15 m	0 - 18 m	> 20 m
Polarization		
RHCP	RHCP	LINEAR
Schutzklasse		
IP54	IP67	IP65
Characteristics		
High efficient	Focused beam	Focused beam in 2 level
Focused beam	Outdoor	Outdoor
Small footprint		No polarization loss
Easy to integrate		
Applications		
Dock door	Dock door	Vehicle & train identification
Track & Trace	Track & Trace	Multi- & Single-Lane Free Flow
Access control	Vehicle identification	Tolling plaza
RFID tunnel	Multi-Lane Free Flow	
	Tolling plaza	



## PRO Line antennas

The PRO Line antennas are particularly robust antennas and therefore suitable for the highest mechanical loads and harsh environments. Low-range, mid-range and wide-range antennas enable a variety of different applications. With the ©KRAI (Kathrein RFID Antenna Interface) system, Kathrein also offers antennas that automatically adjust to the respective requirements. For example, the polarization (alignment of the transponder to the antenna) can be adjusted with the WideRange 70° ©KRAI or the SSMH ©KRAI antenna can be cascaded in order to record the reading location as well as the reading data. Based on this variety, the optimum antenna can be selected for each type of application.

### > LowRange PRO antenna overview

- Extremely high selectivity
- Reading range 20 cm
- Minimal form factor
- Protection class IP67
- Ideal for near-field applications
- Ideal for applications in the industrial environment



Order number	ETSI version	FCC version	Global version
	52010084	52010085	52010092
Name	LowRange PRO antenna ETSI	LowRange PRO antenna FCC	U-LowRange PRO antenna ETSI-FCC
Frequency range [MHz]	865-868	902-928	865-928
Range of near-field tags [cm]	typ. 7 @ NF-Tags		typ. 3 @ NF-Tags
Selectivity of near-field tags [cm]	typ. 5 @ NF-Tags		typ. 3 @ NF-Tags
Range of far-field tags [cm]	-	-	typ. 8 @ FF-Tags
Selectivity of far-field tags [cm]	-	-	typ. 10 @ FF-Tags
EIFF [dB]	20		15
Antenna gain [dBiC]	-15		-30
VSWR	< 1.3:1	< 1.8:1	< 1.2:1
Connection	TNC female		
Operating temperature range [°C]	-20 to +55		
Storage temperature range [°C]	-40 to +85		
Protection class	IP67*		

\* When connected with the Kathrein antenna cable

#### Accessories

Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR
52010174	3 m low-loss 240 antenna cable TNC/TNCR
52010175	6 m low-loss 240 antenna cable TNC/TNCR
52010176	10 m low-loss 240 antenna cable TNC/TNCR
52010177	15 m low-loss 240 antenna cable TNC/TNCR



### MidRange 100° PRO antenna overview

- Compact, slim design
- Protection class IP67
- Read range up to 2 m
- Suitable for group and individual readings
- Ideal for applications in the industrial environment



Order number	ETSI version	FCC version	Global version
	52010082	52010083	52010172
Name	MidRange 100° PRO antenna ETSI	MidRange 100° PRO antenna FCC	S-MidRange 100° PRO antenna ETSI-FCC
Frequency range [MHz]	865-868	902-928	865-928
Half-power beam width [°]	100		
Reading range [m]	typ. 0.2-2		typ. 0.1-1
Polarization	circular, LHCP*		circular, RHCP***
Antenna gain [dBiC]	2.5 (@ 866 MHz)	2.5 (@ 915 MHz)	-12 (@ 866 MHz) -10 (@ 915 MHz)
Axial ratio [dB]	typ. 1.5		typ. 2.0
VSWR	typ. 1.3:1		typ. 1.4:1
Connection	TNC female		
Operating temperature range [°C]	-20 to +55		
Storage temperature range [°C]	-40 to +85		
Protection class	IP67**		
Dimensions (L x W x H) [mm]	126.3 x 156 x 36		

\* Left-hand circular polarization \*\* When connected with the Kathrein antenna cable \*\*\* Right-hand circular polarization

#### Accessories

Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR
52010174	3 m low-loss 240 antenna cable TNC/TNCR
52010175	6 m low-loss 240 antenna cable TNC/TNCR
52010176	10 m low-loss 240 antenna cable TNC/TNCR
52010177	15 m low-loss 240 antenna cable TNC/TNCR
52010351	Outdoor wall bracket

### WideRange 40° PRO antenna overview

- Compact design for robust outdoor applications
- Linear polarization for optimum reception of weak transponders
- Prepared for 3D mounting kit (52010262)
- Reading range up to 30 m
- Ideal solution for vehicle identification



Order number	ETSI Version	FCC Version
	52010251	52010252
Name	WideRange 40° PRO antenna	WideRange 40° PRO antenna
Frequency range [MHz]	865-868	902-928
Half-power beam width [°]	40/40	
Polarisation	linear	
Antenna gain [dBi]	typ. 12.5	typ. 13
VSWR	typ. 1.3 : 1	
Connector	N-socket	
Operating temperature range [°C]	-40 to 70	
Storage temperature range [°C]	-40 to 85	
Protection class	IP67	
Dimensions (L x B x H) [mm]	480 x 480 x 45.5	

#### Accessories

Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR
52010174	3 m low-loss 240 antenna cable TNC/TNCR
52010175	6 m low-loss 240 antenna cable TNC/TNCR
52010176	10 m low-loss 240 antenna cable TNC/TNCR
52010177	15 m low-loss 240 antenna cable TNC/TNCR
52010250	15 m low-loss antenna cable N/TNCR
52010178	Antenna adapter N to TNC
52010262	Outdoor wall bracket



## WideRange 60° PRO antenna overview

- Compact design
- Protection class IP67
- Read range up to 5 m
- Homogeneous, selective reading field with symmetrical pattern
- Very high front/back ratio
- For applications in the radiated near field and for identification of static transponders



Order number	ETSI version	FCC version
	52010423	52010424
Name	WideRange 60° PRO antenna	WideRange 60° PRO antenna
Frequency range [MHz]	865-868	902-928
Half-power beam width [°]	60/60	
Polarization	circular, RHCP*	
Antenna gain [dBiC]	typ. 5.5 (at 866 MHz)	typ. 5.5 (at 915 MHz)
Axial ratio	typ. 1	
VSWR	typ. 1.2:1	
Connection	TNC female	
Operating temperature range [°C]	-40 to +70	
Storage temperature range [°C]	-40 to +85	
Protection class	IP67**	
Dimensions (L x W x H) [mm]	300 x 300 x 49	

\* Right-hand circular polarization \*\* When connected with the Kathrein antenna cable

### Accessories

Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR
52010174	3 m low-loss 240 antenna cable TNC/TNCR
52010175	6 m low-loss 240 antenna cable TNC/TNCR
52010176	10 m low-loss 240 antenna cable TNC/TNCR
52010177	15 m low-loss 240 antenna cable TNC/TNCR
52010351	Outdoor wall bracket
52010261	Indoor wall bracket
52010479	Shelf fitting kit for ARU 2400 Reader, WRA 6060, WRA 7070

## WideRange 70° PRO antenna overview

- Compact design
- Protection class IP67
- Read range up to 12 m
- Homogeneous reading field with symmetrical pattern
- ©KRAI interface for switching polarization (LHCP, RHCP, lin. hor., lin. ver.)
- Ideal for logistics applications and for recording vehicles



Order number	ETSI version		FCC version	
	52010333	52010335	52010334	52010336
Name	WideRange 70° PRO antenna	WideRange 70° PRO ©KRAI antenna	WideRange 70° PRO antenna	WideRange 70° PRO ©KRAI antenna
Frequency range [MHz]	865-868		902-928	
©KRAI	-	✓	-	✓
LED display, freely programmable	-	4 high-end LED	-	4 high-end LED
Half-power beam width [°]	65/65			
Circular polarization	RHCP**	LHCP/RHCP*	RHCP**	LHCP/RHCP*
Antenna gain circular [dBiC]	typ. 8.5 (at 866 MHz)	typ. 6.5	typ. 8.5 (at 915 MHz)	typ. 6.5
Axial ratio	typ. 1	typ. 2	typ. 1	typ. 2
Linear polarization	-	horizontal/vertical	-	horizontal/vertical
Antenna gain linear [dBi]	-	7.0	-	7.0
VSWR	typ. 1.2:1	typ. 1.4:1	typ. 1.2:1	typ. 1.8:1
Connection	TNC female			
Operating temperature range [°C]	-40 to +70			
Storage temperature range [°C]	-40 to +85			
Protection class	IP67***			
Dimensions (L x W x H) [mm]	300 x 300 x 49			

\* Left-hand/right-hand circular polarization \*\* Right-hand circular polarization \*\*\* When connected with the Kathrein antenna cable

### Accessories

Order number	Description	Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR	52010261	Indoor wall bracket
52010174	3 m low-loss 240 antenna cable	52010351	Outdoor wall bracket
52010175	6 m low-loss 240 antenna cable	52010479	Shelf fitting kit for ARU 2400 Reader, WRA 6060, WRA 7070
52010176	10 m low-loss 240 antenna cable TNC/TNCR		
52010177	15 m low-loss 240 antenna cable TNC/TNCR		



**WideRange 30° 70° PRO antenna overview**

- Compact design
- Read range up to 30 m
- Excellent axial ratio
- Mounting kit for pole mount or gantry mount included
- Ideal for portal applications and vehicle identification



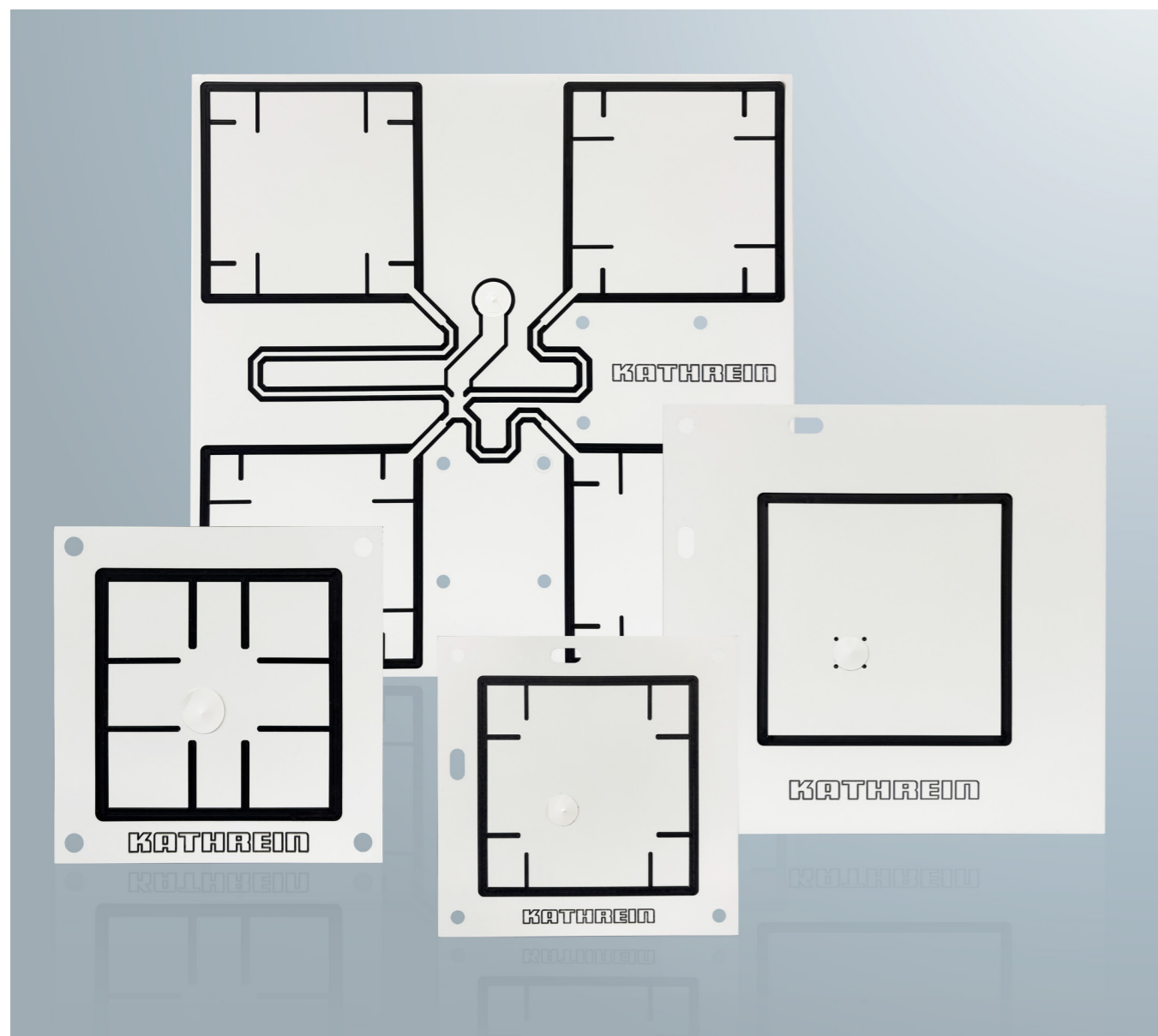
Order number	ETSI version	FCC version
	52010583	52010584
Name	WideRange 30° 70° PRO antenna ETSI	WideRange 30° 70° PRO antenna FCC
Frequency range [MHz]	865-868	902-928
Half-power beam width [°]		30/65
Polarization		circular
Antenna gain [dBiC]	typ. 12	typ. 11,5
VSWR		< 1.2:1
Connector		TNC
Operating temperature range [°C]		-40 to +70
Storage temperature range [°C]		-40 to +85
Protection class		IP67*
Dimensions (L x W x H) [mm]		610 x 320 x 95

\* When connected with the Kathrein antenna cable

**Accessories**

Order number	Description
52010694	1.5 m low-loss 240 antenna cable TNC/TNCR
52010174	3 m low-loss 240 antenna cable TNC/TNCR
52010175	6 m low-loss 240 antenna cable TNC/TNCR
52010176	10 m low-loss 240 antenna cable TNC/TNCR
52010177	15 m low-loss 240 antenna cable TNC/TNCR
52010598	RR-AA TNC-TNC adaptor, right angle plug
52010351	Outdoor wall bracket



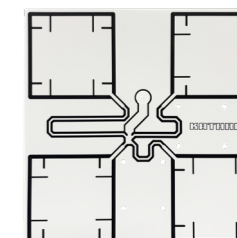


## EDGE Line antennas

Kathrein Solution's passive UHF RFID readers of the **3rd generation** according to ISO 18000-6C convince with first-class reading performance, flexibility, powerful Linux operating systems and IP protection classes suitable for the most versatile applications.

### > WideRange 55° EDGE antenna overview

- Very thin design with a thickness of only 6 mm, making it easy to integrate
- Reading range up to 20 m
- Outstanding antenna gain of 10 dBiC
- Symmetrical beam shape with 55°/55°
- Protection class IP54
- Suitable for eKanBan and logistics applications



Order number	ETSI version	FCC version
	52010712	52010713
Name	WideRange 55° EDGE antenna	WideRange 55° EDGE antenna
Frequency range [MHz]	865-868	902-928
Read range [m]	20	
Polarization	circular, RHCP*	
Antenna gain [dBiC]	10	
Axial ratio [dB]	typ. 1	
Connection	TNC female	
Operating temperature range [°C]	-40 to +80	
Storage temperature range [°C]	-40 to +85	
Protection class	IP54	
Dimensions (L x W x H) [mm]	300 x 300 x 6	

\* Right-hand circular polarization

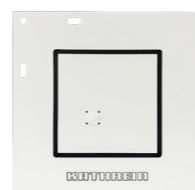
#### Accessories

Order number	Description	Order number	Description
52010485	0.5 m RFID antenna cable, FAKRA-FAKRA	52010451	1 m RFID antenna cable, SMA-FAKRA
52010486	1 m RFID antenna cable, FAKRA-FAKRA	52010452	3 m RFID antenna cable, SMA-FAKRA
52010487	3 m RFID antenna cable, FAKRA-FAKRA	52010453	5 m RFID antenna cable, SMA-FAKRA
52010488	5 m RFID antenna cable, FAKRA-FAKRA		
52010527	1 m RFID antenna cable, FAKRA-TNC-R		
52010528	3 m RFID antenna cable, FAKRA-TNC-R		
52010529	5 m RFID antenna cable, FAKRA-TNC-R		



### > WideRange 80° EDGE antenna overview

- Very thin design with a thickness of only 6 mm, making it easy to integrate
- Reading range up to 10 m
- Outstanding antenna gain of 7.5 dBiC
- Symmetrical beam shape with 80°/80°
- Protection class IP54
- Suitable for eKanBan and logistics applications



Order number	ETSI version	FCC version
	52010725	52010726
Name	WideRange 80° EDGE antenna unit	WideRange 80° EDGE antenna unit
Frequency range [MHz]	865-868	902-928
Read range [m]	10	
Polarization	circular, RHCP*	
Antenna gain [dBiC]	7.5	
Axial ratio [dB]	typ. 1	
Connection	TNC female	
Operating temperature range [°C]	-40 to +80	
Storage temperature range [°C]	-40 to +85	
Protection class	IP54	
Dimensions (L x W x H) [mm]	200 x 200 x 6	

\* Right-hand circular polarization

#### Accessories

Order number	Description
52010485	0.5 m RFID antenna cable, FAKRA-FAKRA
52010486	1 m RFID antenna cable, FAKRA-FAKRA
52010487	3 m RFID antenna cable, FAKRA-FAKRA
52010488	5 m RFID antenna cable, FAKRA-FAKRA
52010527	1 m RFID antenna cable, FAKRA-TNC-R
52010528	3 m RFID antenna cable, FAKRA-TNC-R
52010529	5 m RFID antenna cable, FAKRA-TNC-R

Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA
52010452	3 m RFID antenna cable, SMA-FAKRA
52010453	5 m RFID antenna cable, SMA-FAKRA

### > MidRange 90° EDGE antenna overview

- Very thin design with a thickness of only 6 mm, making it easy to integrate
- Reading range up to 7 m
- Outstanding antenna gain of 6.5 dBiC
- Symmetrical beam shape with 90°/90°
- Protection class IP40
- Suitable for eKanBan and logistics applications



Order number	ETSI version	FCC version
	52010710	52010711
Name	MidRange 90° EDGE antenna unit	MidRange 90° EDGE antenna unit
Frequency range [MHz]	865-868	902-928
Read range [m]	0 - 7	
Polarization	circular, RHCP*	
Antenna gain [dBiC]	6.5	
Axial ratio [dB]	typ. 1.5	
Connection	SMA 90°	
Operating temperature range [°C]	-40 to +80	
Storage temperature range [°C]	-40 to +85	
Protection class	IP40	
Dimensions (L x W x H) [mm]	150 x 150 x 6	

\* Right-hand circular polarization

#### Accessories

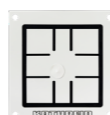
Order number	Description
52010485	0.5 m RFID antenna cable, FAKRA-FAKRA
52010486	1 m RFID antenna cable, FAKRA-FAKRA
52010487	3 m RFID antenna cable, FAKRA-FAKRA
52010488	5 m RFID antenna cable, FAKRA-FAKRA
52010527	1 m RFID antenna cable, FAKRA-TNC-R
52010528	3 m RFID antenna cable, FAKRA-TNC-R
52010529	5 m RFID antenna cable, FAKRA-TNC-R

Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA
52010452	3 m RFID antenna cable, SMA-FAKRA
52010453	5 m RFID antenna cable, SMA-FAKRA



### > MidRange 100° EDGE antenna overview

- Very thin design with a thickness of only 6 mm, making it easy to integrate
- Reading range up to 5 m
- Outstanding antenna gain of 5 dBiC
- Symmetrical beam shape with 100°/100°
- Protection class IP40
- Suitable for eKanBan and logistics applications



Order number	ETSI version	
	52010723	
Name	MidRange 100° EDGE antenna	
Frequency range [MHz]	865-868	
Read range [m]	0 - 5	
Polarization	circular, RHCP*	
Antenna gain [dBiC]	5	
Axial ratio [dB]	typ. 2	
Connection	SMA 90°	
Operating temperature range [°C]	-40 to +80	
Storage temperature range [°C]	-40 to +85	
Protection class	IP40	
Dimensions (L x W x H) [mm]	120 x 120 x 6	

\* Right-hand circular polarization

#### Accessories

Order number	Description
52010485	0.5 m RFID antenna cable, FAKRA-FAKRA
52010486	1 m RFID antenna cable, FAKRA-FAKRA
52010487	3 m RFID antenna cable, FAKRA-FAKRA
52010488	5 m RFID antenna cable, FAKRA-FAKRA
52010527	1 m RFID antenna cable, FAKRA-TNC-R
52010528	3 m RFID antenna cable, FAKRA-TNC-R
52010529	5 m RFID antenna cable, FAKRA-TNC-R

Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA
52010452	3 m RFID antenna cable, SMA-FAKRA
52010453	5 m RFID antenna cable, SMA-FAKRA

### > SmartShelf 60° EDGE antenna overview

- Super-slim design
- Read range up to 3 m
- Homogeneous, selective reading field with symmetrical pattern
- Robust and vibration-resistant
- Cascadable with up to 32 antennas using ©KRAI
- Suitable for e-KanBan and logistics applications



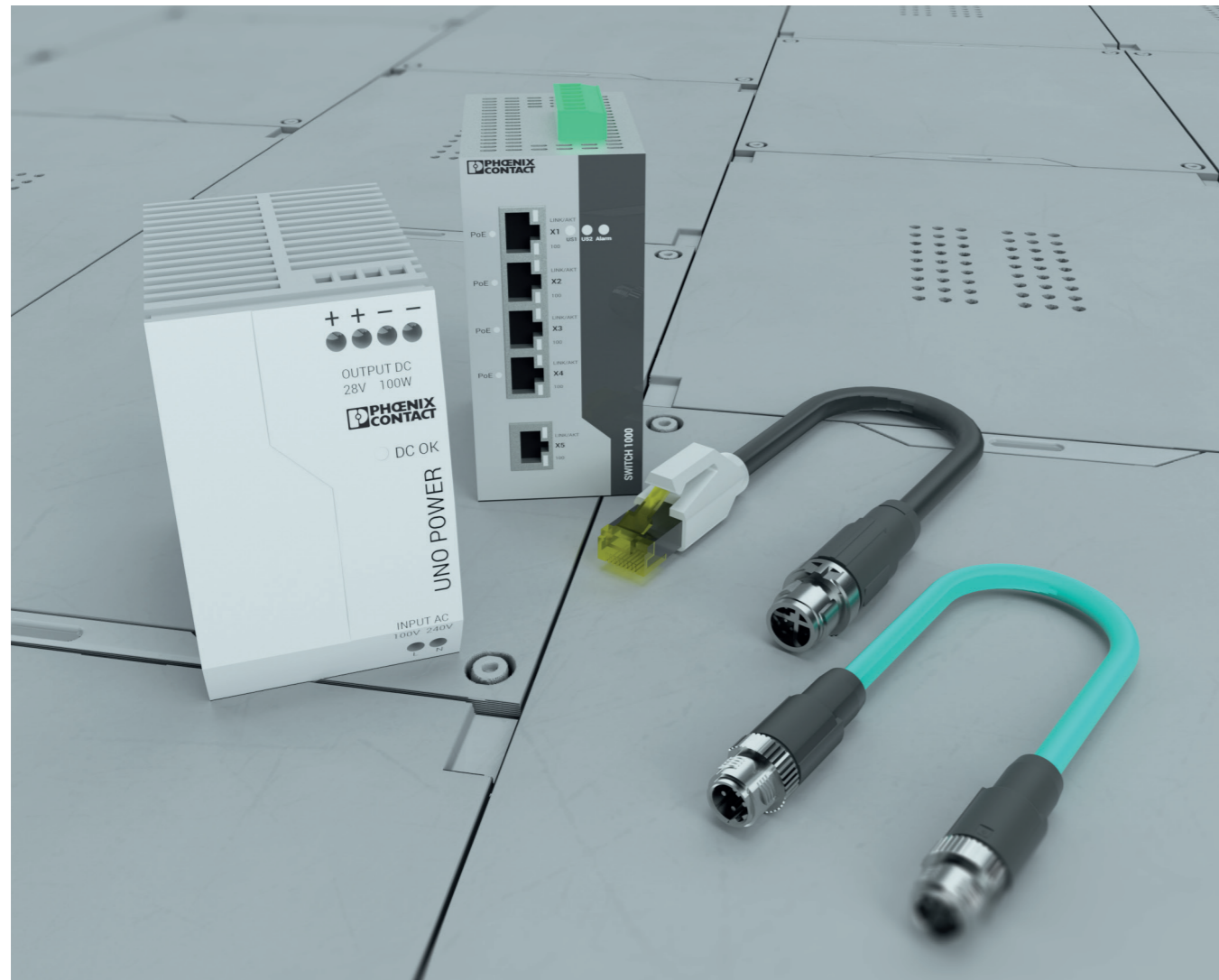
Order number	ETSI version		FCC version	
	52010523	52010524	52010525	52010526
Name	SMSH 60° EDGE antenna	SMSH 60° EDGE ©KRAI antenna	SMSH 60° EDGE antenna	SMSH 60° EDGE ©KRAI antenna
Frequency range [MHz]	865-868		902-928	
©KRAI	-	cascading	-	cascading
Protective cover	✓			
Read range [m]	0 - 3			
Polarization	circular, RHCP*			
Antenna gain [dBiC]	typ. 4.5		typ. 5	
Axial ratio [dB]	typ. 2			
VSWR	typ. 1.3:1			
Connection	FAKRA			
Operating temperature range [°C]	-20 to +55			
Storage temperature range [°C]	-40 to +85			
Protection class	Indoor			
Dimensions (L x W x H) [mm]	340 x 330 x 20			

\* Right-hand circular polarization

#### Accessories

Order number	Description
52010485	0.5 m RFID antenna cable, FAKRA-FAKRA
52010486	1 m RFID antenna cable, FAKRA-FAKRA
52010487	3 m RFID antenna cable, FAKRA-FAKRA
52010488	5 m RFID antenna cable, FAKRA-FAKRA
52010527	1 m RFID antenna cable, FAKRA-TNC-R
52010528	3 m RFID antenna cable, FAKRA-TNC-R
52010529	5 m RFID antenna cable, FAKRA-TNC-R

Order number	Description
52010451	1 m RFID antenna cable, SMA-FAKRA
52010452	3 m RFID antenna cable, SMA-FAKRA
52010453	5 m RFID antenna cable, SMA-FAKRA
52010398	Backplane



## RFID accessories

Power supply, data and I/O connection and assembly accessories for Kathrein Solutions RFID readers and antennas.

### > Power supply

Order number	Name	Description
<b>For all readers</b>		
52010365	R-RPA 24VDC-72 W	RRU/ARU AC/DC power supply unit 24 V/72 W
52010366	R-RPA 24VDC-90 W	RRU/ARU AC/DC power supply unit 24 V/90 W
52020369	R-ETH-SW-100	PoE+ Ethernet switch, 4-port
52010370	R-POE-INJ-30	PoE+ injektor, 30 W, 100 Mbit für RRU und ARU
<b>For RRU 4000, RRU 7700, ARU 3000, ARU 7700, ARU 8500</b>		
52010364	R-RPA3 24VDC-90 W	RRU/ARU AC/DC POWER SUPPLY UNIT 24 V/90 W
<b>For RRU 4000, RRU 7700, ARU 3000, ARU 7700, ARU 8500</b>		
52010474	R-PRA 24DC-18W	AC/DC power supply unit 24 V/18 W, AC 110–230 V, mains plug device, replaceable AC plug



52010365



52010366



52010369



52010370



52010364



52010474

### > Reader connection cable for RRU 4000, ARU 3000, ARU 8500

Order number	Name	Length	Description
52010358	R-CC3-10-DC	10 m	RRU/ARU DC power cable
52010359	R-CC3-03-DC	3 m	RRU/ARU DC power cable
52010360	R-CC3 10 ETH	10 m	RRU/ARU Ethernet cable M12/RJ45
52010361	R-CC3-03-ETH	3 m	RRU/ARU Ethernet cable M12/RJ45
52010362	R-CC3 10 GPIO	10 m	RRU/ARU GPIO cable M12
52010363	R-CC3-03-GPIO	3 m	RRU/ARU GPIO cable M12
52010373	R-BC3-10-ETH	10 m	RRU/ARU Ethernet bridge cable
52010431	R-AC3 GPIO	0.5 m	RRU/ARU adapter cable GPIO, IP65, M12 male 12-pole, A-coded, 2x M12 female 8-pole, A-coded
52010432	R-AC3 ETH	0.5 m	RRU/ARU adapter cable Ethernet, IP65, M12 female 4-pole, D-coded, M12 male 8-pole, X-coded
52010376	PCS-G3-IP67		Protective cap set for RRU 4000, ARU 3000, IP67



52010358/359



52010360/361



52010362/363



52010373



52010431



52010376



> **Antenna cables**

Order number	Name	Description
<b>For RRU 4000, ARU 8500, ARU 3000</b>		
52010694	R-AC 1.5 TNC-TNCR	LL 240 flex, L = 1.5 m, IP65 robust design
52010174	R-AC 3 TNC-TNCR	LL 240 flex, L = 3 m, IP65 robust design
52010175	R-AC 6 TNC-TNCR	LL 240 flex, L = 6 m, IP65 robust design
52010176	R-AC 10 TNC-TNCR	LL 240 flex, L = 10 m, IP65 robust design
52010177	R-AC 15 TNC-TNCR	LL 240 flex, L = 15 m, IP65 robust design
52010598	R-AA TNC-TNC	TNV socket (f) to TNC plug (m), right angle plug
52010527	R-AC 1 FAKRA-TNCR	RFID antenna cable, L=1 m, IP40, FAKRA Z-coded to TNCR
52010528	R-AC 3 FAKRA-TNCR	RFID antenna cable, L=3 m, IP40, FAKRA Z-coded to TNCR
52010529	R-AC 5 FAKRA-TNCR	RFID antenna cable, L=5 m, IP40, FAKRA Z-coded to TNCR
<b>For ARU 2400 and RRU 1400</b>		
52010485	R-AC 0.5 FAKRA-FAKRA	RFID antenna cable, L=0.5 m, IP40, FAKRA Z-coded to FAKRA Z-coded
52010486	R-AC 1 FAKRA-FAKRA	RFID antenna cable, L=1 m, IP40, FAKRA Z-coded to FAKRA Z-coded
52010487	R-AC 3 FAKRA-FAKRA	RFID antenna cable, L=3 m, IP40, FAKRA Z-coded to FAKRA Z-coded
52010488	R-AC 5 FAKRA-FAKRA	RFID antenna cable, L=5 m, IP40, FAKRA Z-coded to FAKRA Z-coded
52010451	R-AC 1 SMA-FAKRA	RFID antenna cable, L=1 m, IP40; FAKRA Z-coded to SMA (m); right angle antenna plug
52010452	R-AC 3 SMA-FAKRA	RFID antenna cable, L=3 m, IP40; FAKRA Z-coded to SMA (m); right angle antenna plug
52010453	R-AC 5 SMA-FAKRA	RFID antenna cable, L=5 m, IP40; FAKRA Z-coded to SMA (m); right angle antenna plug
52010461	R-AC 1 TNC-FAKRA	RFID antenna cable, L=1 m, IP40; FAKRA Z-coded to TNC (m); right angle antenna plug
52010462	R-AC 3 TNC-FAKRA	RFID antenna cable, L=3 m, IP40; FAKRA Z-coded to TNC (m); right angle antenna plug
52010463	R-AC 5 TNC-FAKRA	RFID antenna cable, L=5 m, IP40; FAKRA Z-coded to TNC (m); right angle antenna plug
<b>For antennas with TNC connection</b>		
52010598	R-AA TNC- TNC adapter	90° TNC to TNC angle adapter



52010174



52010250



52010598



52010527/528/529



52010461/462/463



52010451/452/453



52010485/486/487/488

> **Connection box**

Order number	Name	Description
52010539	CB-A2	Advanced connection box; IP66, 230 V power supply unit, Ethernet, GPIO, AC breaker
52010540	CB-B2	Basic connection box, IP66, 230 V power supply unit, AC breaker
52010662	MK-CB-A2	Montage Kit for CB-A2 Connection Box Advanced
52010663	MK-CB-B2	Montage Kit for CB-B2 Connection Box Basic



52010540



52010539



52010662



52010663

> **SMSH aluminum back wall**

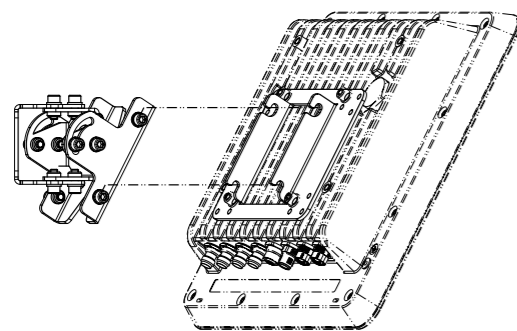
Order number	Name	Description
52010398	SMSH-BP-ALU	Aluminum back wall for SMSH



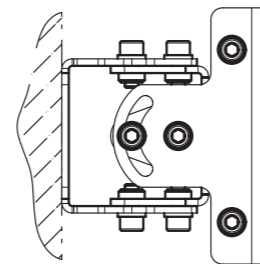


> Outdoor wall/pole mounting kit for RAIN RFID hardware

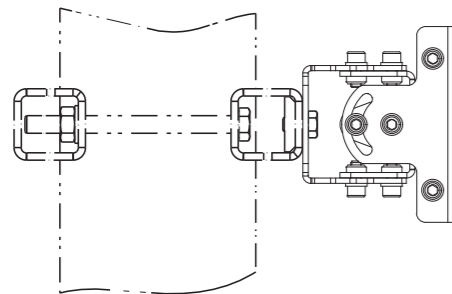
Order number	Name	Description
52010351	MK-WPM3-OSS Outdoor	Outdoor wall bracket
52010368	MK-PMA-OGV	Pole fitting extension for 52010351



52010351



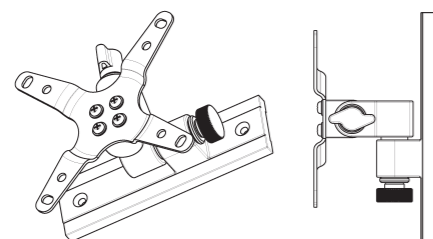
52010351/wall



52010368/Pole mount adapter for 52010351

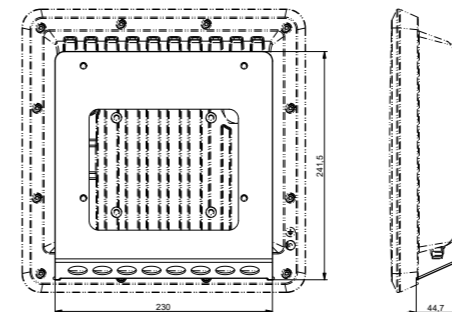
> Indoor wall mounting kit for RAIN RFID hardware

Order number	Name	Description
52010261	MK-WM-100-100-Indoor	Indoor wall bracket



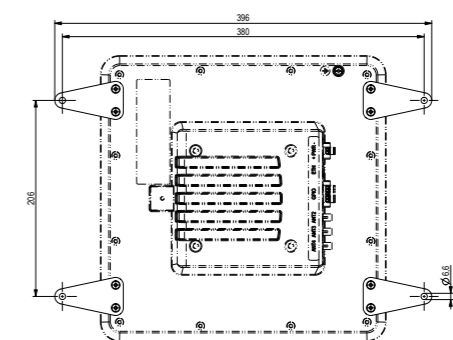
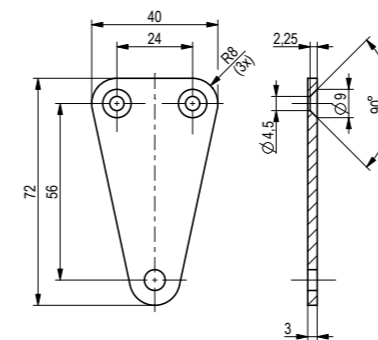
> Vandalism protection for RRU 4000, ARU 3000, ARU 8500

Order number	Name	Description
52010367	R-RVP3-VPP-SS	Vandalism protection for RRU 4000, ARU 3000



> Shelf fitting kit for ARU 2400 Reader, WRA 6060 and WRA 7070

Order number	Name	Description
52010479	MK-SHM-4IP	Shelf fitting kit for ARU 2400 Reader, WRA 6060, WRA 7070





> **RFID software overview**

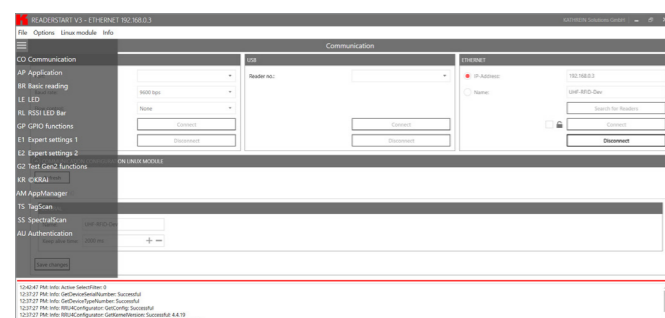
	ReaderStart	LLRP App	TagBlower App	ProfiNet IO App	Access Manager	Reader API	CrossTalk
KBRP support	✓	✓	✓	✓	✓	✓	✓
Productive system		✓	✓	✓	✓		✓
Local file storage	✓		✓				✓
CSV generation	✓		✓				✓
HTTP data transmission			✓				✓
Configuration/test software	✓						
WhiteList handling					✓		✓
Profinet				✓			
MQTT business event							✓
XML / JSON generation							✓
Device management							✓
Cloud ready							✓
OPC-UA client							✓
Cloud ready							✓
Areas of application	· Configuration · Demonstration · Test	Low-level applications universal interface	Automatic raw data transmission	ProfiBUS applications	Access control	Application development by partners	· Logistics · Healthcare · Automotive · Manufacturing · Supply chain · KanBan · ITS

## Software RAIN RFID portfolio

Kathrein Solution's RFID portfolio with integrated Linux processor offers partners and customers the opportunity to implement Kathrein software or even their own apps directly on the device. Our flexible and highly functional product is the CrossTalk Software Suite.



> **Kathrein ReaderStart software**



**ReaderStart**

Kathrein Solutions offers a configuration and test software named ReaderStart. Using predefined templates, such as gate applications or vehicle identification, the reader can be preset with the push of a button and an initial reading result is available quickly. Only a few more settings are then required to adapt it to the final environment.

> **Kathrein reader application software**

**LLRP**

The LLRP app from Kathrein Solutions enables standardized communication of basic commands and basic data between the RFID reader and an application SW using a standard protocol from EPCglobal protocol. This app runs on the reader's internal Linux IPC and connects to an LLRP controller. The supported standard is LLRP 1.0.1 and the defined transmission port is 5084.

**Advantages:**

- Standardized commands
- Universal data and configuration interface
- Standard transmission port 5084

**TagBlower**

The TagBlower app is a simple application that makes it possible to distribute data quickly in a defined way. The data read are stored automatically at a predefined port and can be accessed and picked up by an external listener. In addition to the data read, status messages (e.g. "Transponder approaching") can also be issued. This range of data and status messages can be customized. Data can therefore be captured in simple applications or early in the realization phase.

**Advantages:**

- Multiple listeners
- Push notifications
- Configurable

**ProfiNet IO**

The ProfiNet IO app allows integration of a reader into a ProfinetIO environment. This is typical for applications in production and allows the reader to communicate with the production control system. The reader thus acts as an IO device and transmits the transponder data it reads directly to the connected PLC. The reader is therefore the perfect data source in this production environment.

**Advantages:**

- Industrial Ethernet standard
- Fast IO communication
- High data rate

> **Kathrein reader application software**

**AccessManager**

The AccessManager app from Kathrein Solutions combines RFID reading results with digital input and output signals (GPIO) and makes decisions on that basis. As a result, anything from access authorizations at parking garage barriers to sorting systems for containers can be managed autonomously. The starting point is an input signal from a light barrier or a sensor, which is read by a digital input on the reader. This starts an automatic process which reads transponder data and takes decisions on the basis of a predefined white list. These decisions can be sent to digital outputs immediately to

operate conveyor belt switches or parking barrier relays. Additionally, the LEDs on the reader can be activated to give the user visual feedback on the process. The AccessManager allows rules to be created easily in the Linux operating system without any programming knowledge. In addition to the authorizations recorded, each reading event can be stored in a log file. The participant identification and precise time are recorded in an SQLite database. This information can be retrieved for a set period, with access via a remote connection or locally as a CSV or XML file.

**Kathrein software: order overview**

Order number	Name	Description
free*	ReaderStart test- and configuration software	for all Kathrein readers
free*	LLRP communication protocol (low level reader protocol app)	for all Kathrein readers
52010381	TagBlower app software	for all Kathrein readers
52010375	ProfiNet app software	for all Kathrein readers, except x4xx
52010217	AccessManager software	for all Kathrein readers

\* free download from website



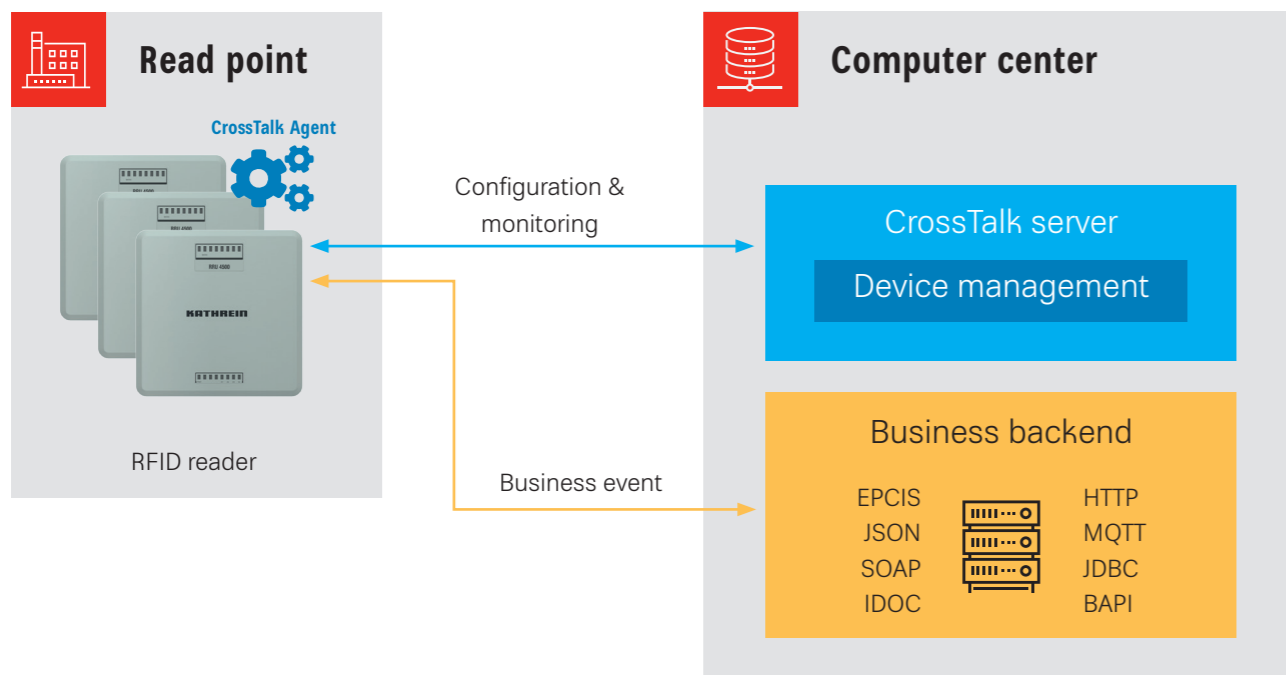
## > CrossTalk software suite

As with all complex systems, the perfect interplay of hardware and software is of crucial importance. CrossTalk rises to this challenge extremely effectively and simplifies implementation of a wide range of RAIN RFID customer requirements and solution requests with no additional development effort.

CrossTalk is the easiest way to create the perfect AutoID solution. It supports partners and customers from

the PoC (proof of concept) through to global rollout with secure and reliable 24/7 operation of the physical AutoID layer.

The agent-based architecture of CrossTalk supports operation of several thousands of devices using different technologies in a distributed network environment. Plug-and-play setup for a wide range of devices and models made by standard AutoID manufacturers is already integrated.



## > Kathrein software: order overview\*

Order number	Description
52010313	<b>CrossTalk BaseApp Center license:</b> device management platform, AutoID device drivers, AutoID process toolkit, infrastructure application, infrastructure documentation, rules engine, 3rd party backend integration - license per logical read point
52010317	<b>CrossTalk Service Contract:</b> CrossTalk maintenance and 3rd-level-support for 1 year

\*Available as one time purchase or yearly subscription model

## > CrossTalk Agent

The CrossTalk Agent edgware is Java-based and therefore runs on a variety of platforms. Each agent is given its individual functionality once by a central CrossTalk server entity. The agent, which is ideally operated directly on the device, carries out its processing activities completely independently from this server entity.

The CrossTalk server is then only responsible for monitoring the agents in the background. This decentralized distribution of the process functionality among the CrossTalk agents provides high failure security for the AutoID reading points.

With a large number of existing data structures and communications adapters in productive use, it is possible to supply various backend systems with valid business events quickly and reliably.

### Core tasks of the edgware:

- Very easy integration of a wide range of AutoID manufacturers
- Real-time raw data processing
- Intelligent filtering of raw data
- Business event generation and transmission to the backend system

### Event generation

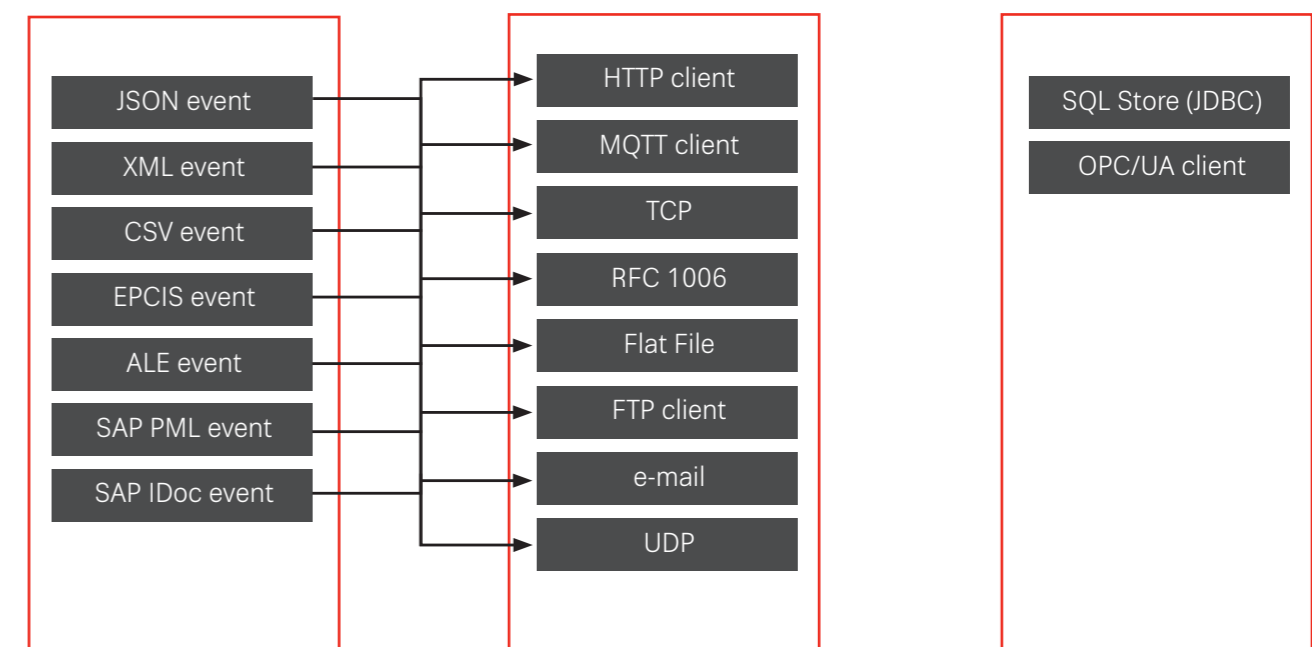
Converts AutoID data (RFID, RTLS, etc...) into the appropriate event format

### Event Transfer

Forwards the formatted business events to the backend system

### Direct data interfaces

AutoID data is stored directly with configured data structure





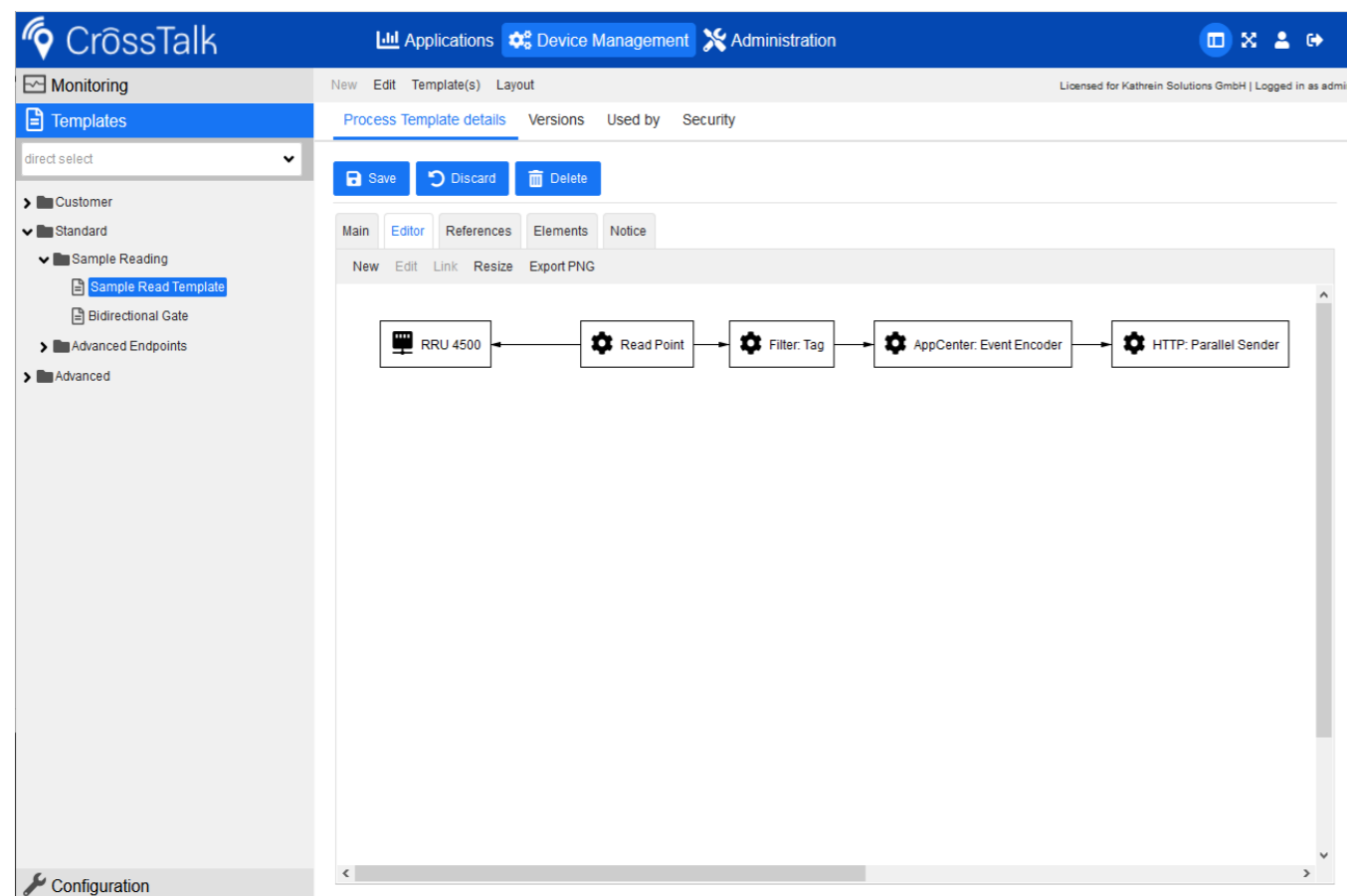
## > CrossTalk Server

The central server entity can be operated either “on-premise” or in a cloud. All that is required for this is a Java application server and standard SQL database.

### Core tasks of device management:

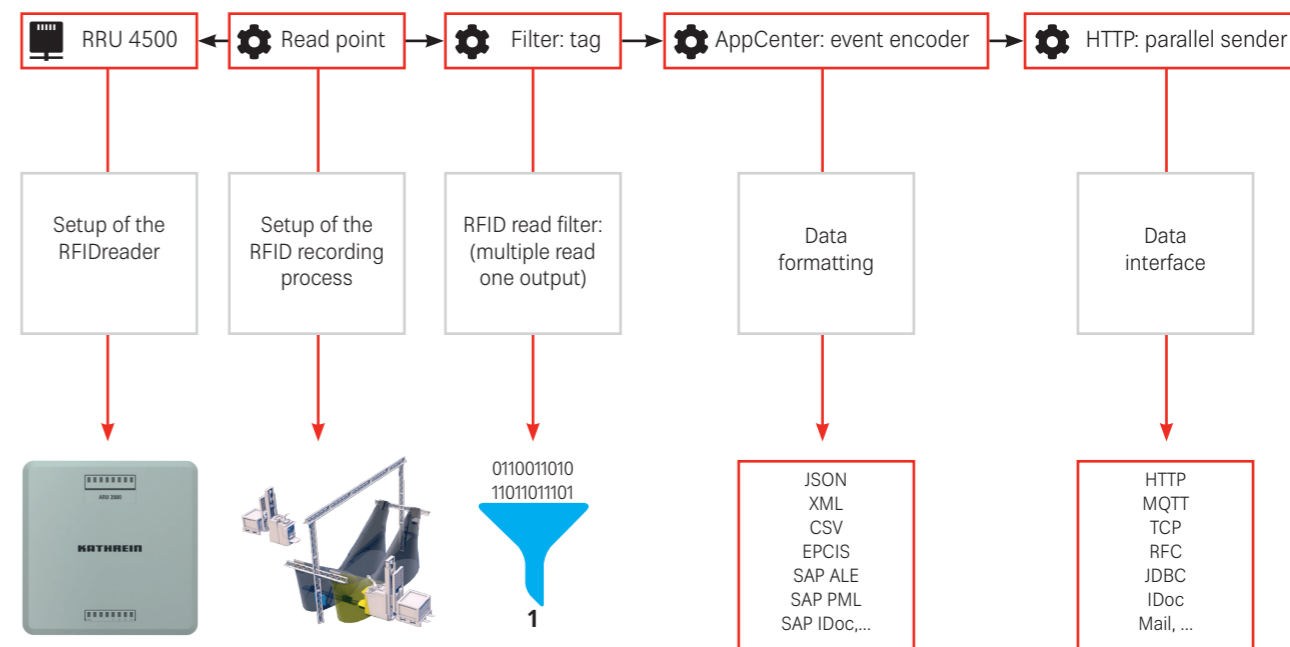
- Organization and configuration of all CrossTalk Agents
- Monitoring and analysis of all functional modules in ongoing processes on the agents
- Design of process templates using a large number of existing function modules without programming effort in a graphical „no-code” designer
- Central distribution of updates (driver layer and functional modules)
- Simple rollout of a large number of agents and their processes, based on process templates already in existence
- Central alarm notification of maintenance teams if a functional module within the processes reports an error on the agent (central health REST API, e-mail)

The device management application on the server allows complete control of the AutoID landscape with devices from different manufacturers.



Graphical template designer for the device management application

## > Typical functional modules of a process template





## Professional services

The extensive foundation of the Kathrein Solutions IoT portfolio is available to its partners within the KATHREIN partner ecosystem and the end customers at any time and in all phases of the project.

In cooperation with our partners, the Professional Services Team provides various services such as pre-sales, consulting, project management and the Training Academy. Kathrein Solutions and its partners also offer 3rd level software support to ensure the availability of the systems installed in the field.

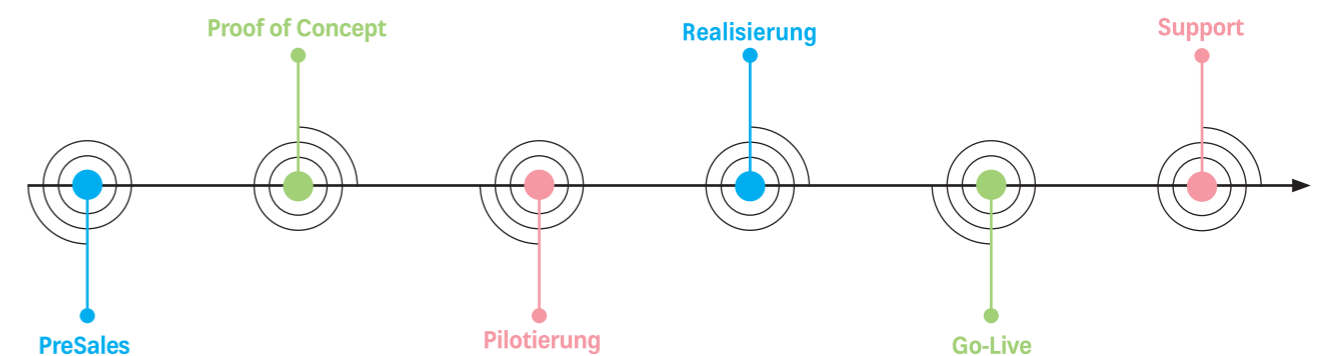
This leads to highly efficient and competent order acquisition as well as successful project implementation.

## > Consulting

### Technology consulting directly from the experts

Our experienced, multidisciplinary team of consultants offers you individual advising to move your project forward with the right solutions.

With a multitude of projects successfully completed in a wide range of industries, we can apply our expertise in the areas of RFID and RTLS to any phase of the project you like.



Through the combination of your industry knowledge and experience of your day-to-day business and our expertise in technology and experience from a large number of projects, we are able to work with you to develop a concept that suits your digitization strategy. We play to our strengths in both theory and practice. But the starting point is always your idea, and we begin by listening. We discuss your idea together and refine it into a solution concept through our approach to consulting. Then we set out a common solution pathway together to turn your idea into a practical application. Various tried-and-tested methodologies and approaches are available to us here:

- Software-based simulations of individual systems
- Application-based transponder qualification Including coding scheme
- Process analysis and optimization through workshops
- Process-based selection of suitable products (hardware & software)

- Application-based feasibility study (PoC) in our Test Center
- Realistic feasibility study (PoC) in your company
- Transponder calibration in our measurement chambers
- Process assurance through pilot operation with analysis/evaluation of live data
- Template design for CrossTalk applications
- CrossTalk installation and configuration consulting
- Interface integration/management
- Raw data analysis of the completed application

The key to our success is our holistic consideration of the various system parameters, both those that are obviously relevant and those that may, at first sight, appear unimportant. We customize our solution portfolio of hardware, software and services to meet your requirements so that we can offer you maximum quality and performance in every phase of your project.



## > Consulting order overview

Order number	Name	Description
52010321	Blueprinting services	We carry out a feasibility study to check your approach to the project, select the best technology for it and determine the estimated project costs. We develop a customized concept for you based on these findings. We provide you with relevant information so that you can make the most effective decision about your project on a sound basis and with an eye to the future.
52010330	Documentation	A crucial factor in the success of planned projects is transparent documentation in accordance with the amount of work involved. We ensure that all the work packets are properly documented in full.
52010138	Test center & engineer support	Our Kathrein Test and Application Center makes it possible to evaluate ideas and concepts in advance for reliable concept workshops and effective physical tests in a simulated real environment. This avoids any disruptions to your productive operations.
52010572	General support	If you require general hardware and/or software support from our consulting team for a specific period, we'll give you the option of booking a support package.

## > Ticketing process

If you have technical questions, you can simply send us a ticket by email.  
Contact: [support@kathrein-solutions.com](mailto:support@kathrein-solutions.com)

Regardless of whether your questions relate to our hardware or software applications, they will be forwarded to the appropriate specialist in our support team, who will promptly deal with your enquiry.

You can also find this address on our homepage via the "support" tab:

[www.kathrein-solutions.com/de/support/ticketing-system](http://www.kathrein-solutions.com/de/support/ticketing-system)

### Overview of your advantages

- Easy creation of a ticket by email including automatic confirmation of receipt
- High availability during working hours using our central mailbox
- Uniform incoming inspection and content-oriented distribution to the appropriate expert
- Continuous and automated tracking of your tickets so that nothing is left behind
- Complete documentation of all actions within the ticket (mail history)

## > Support

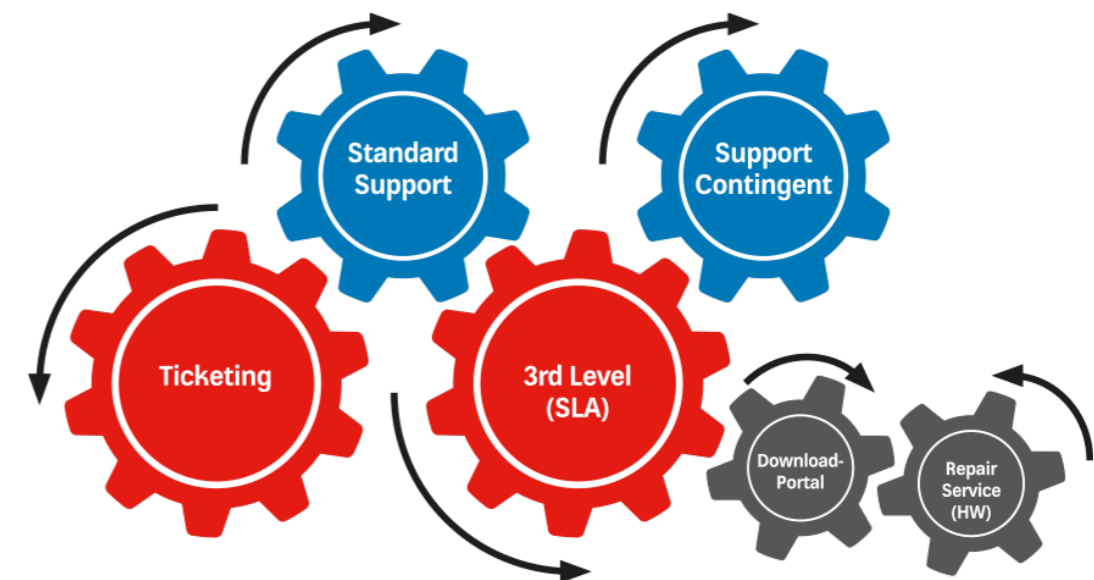
### Support – for all phases of your project

Our versatile support is the final module, rounding off our current service portfolio for you. In addition to specific content, such as consulting, project management

and the Training Academy, we also offer you a wide range of support options. Decide for yourself how you want to utilize them.

### Here are a few suggestions:

- Support package (person days)
- CrossTalk maintenance and 3rd level support services
- Support contract (term-based)
- Standard support for Kathrein partners
- Ticketing via email
- Download portal specifically for CrossTalk
- Hardware repair service
- Go-live support (see also project management)
- Download of firmware, apps and documentation from homepage



## > Support order overview

Order number	Name	Description
52010572	General support	person days over a set period
52010317	Software maintenance contract	CrossTalk 3rd-level remote support with a term of one year



## > Training

### KATRAC – our KATHREIN Training Academy.

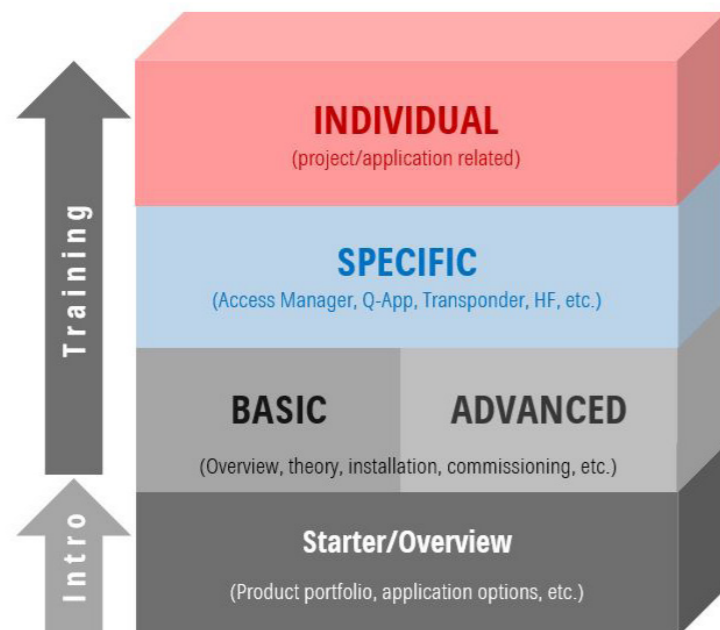
We have set ourselves the aim of combining our RFID and RTLS expertise with our own Kathrein product and solution portfolio to allow us to develop your personal expertise. We are certain that this extra knowledge will give you the edge in terms of time, costs and quality when it comes to delivering your own or our joint projects. We are experts in our field – and we also enjoy turning you into experts, too.

Our modules are so flexible that we can offer everyone new ways of developing their knowledge, from inexperienced rookies to those with many years of experience. Beyond the standard modules, we will be happy to take the time to plan and deliver an individual training course for you, customized to your needs. We also offer you various ways of providing the training.

Choose your preferred variant:

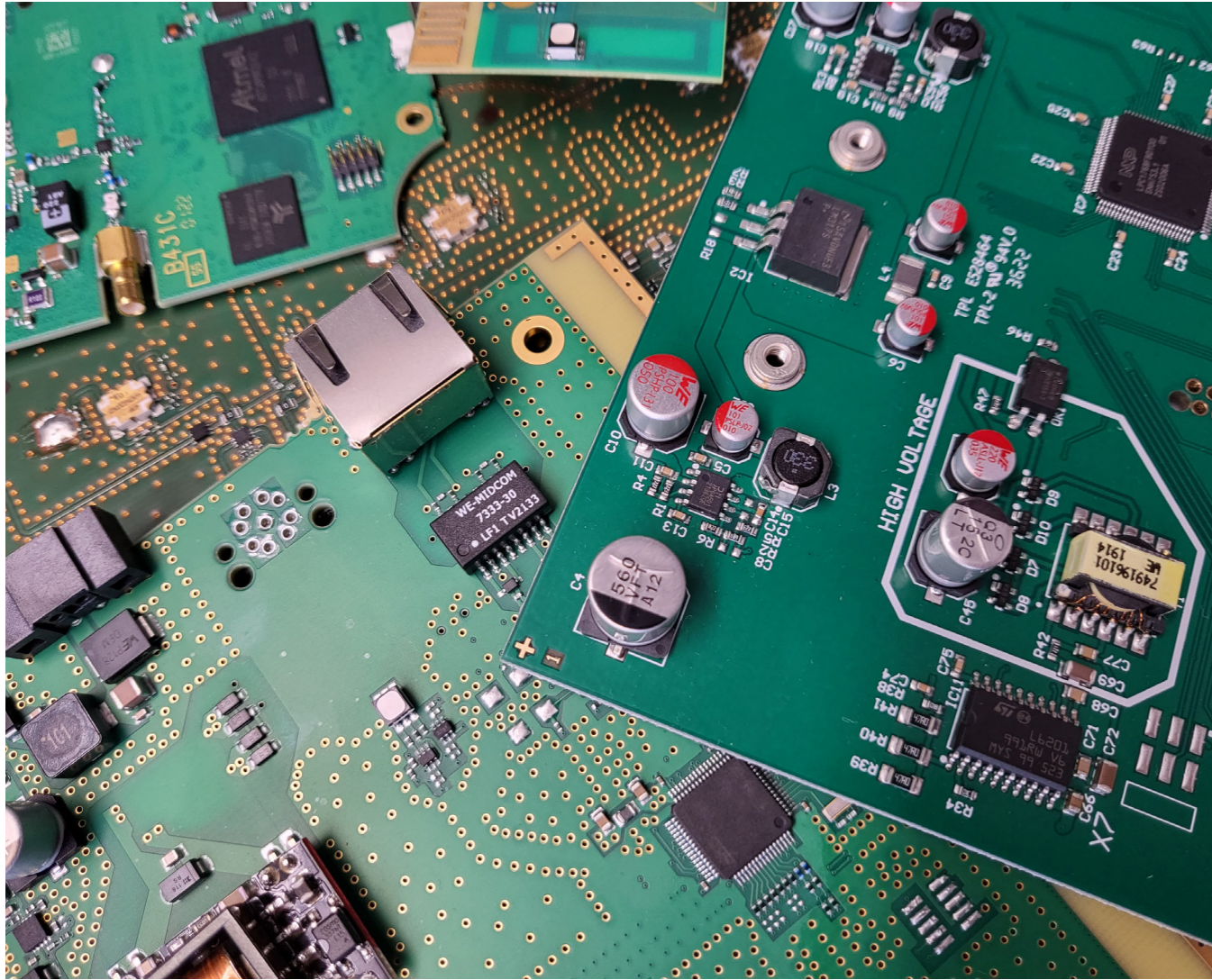
- an in-house course
- a course on our premises in Stephanskirchen (including the Test Center)
- or online by video conference

The graphic provides an overview of our modules. We're sure to have the right course for you, no matter your areas of interest (sales or technical focus).



## > Training order overview

Order number	Name	Description
52010665	KATRAC - BASIC training	Our <b>BASIC Module</b> opens the door to the world of UHF RFID. With both training days we focus on theoretical basics and practical usage with the solution portfolio of Kathrein Solutions GmbH.
52010666	KATRAC - ADVANCED training	Our <b>ADVANCED Module</b> is for users with basic knowledge of UHF RFID. With both training days we focus on conveying expert knowledge and advanced practical usage with the solution portfolio of Kathrein Solutions GmbH.
52010667	KATRAC - SPECIFIC training	Our <b>SPECIFIC module</b> can be designed according to your wishes for specific single applications, which are only cut or not included in the BASIC or ADVANCED module. The training concept is drawn up in advance in joint coordination.
52010668	KATRAC - INDIVIDUAL training	Our <b>INDIVIDUAL module</b> is our most flexible component. In close coordination, for example, an individual training plan can be created or we accompany you individually in your own project via training-on-the-job.
52010569	Travel time	Time for return travel
52010570	Travel costs	Individual costs, such as air/train ticket, subsistence allowance, car rental, etc.
52010571	Overnight accommodation	Hotel costs, etc.



## Customised solutions & individual development

In addition to an extensive hardware and software portfolio, Kathrein Solutions also offers its partners individual developments and OEM solutions for wireless identification and localization using RFID, RTLS and BLE, as well as the development of embedded transponders, high-security transponders, windshield labels and headlamp tags. Where „off-the-shelf“ solutions reach their limits, the development departments offer a wide range of options for implementing customers' digitalization and IoT visions.

### > Customized Solutions

In today's digital world, it is essential for companies to find innovative solutions to optimize their processes and increase their competitiveness. Kathrein Solutions enables the development of customized solutions for your digital transformation. As your partner

in RFID, RTLS, IoT and more, we offer solutions tailored to your specific needs and projects. We cover a wide range of wireless technologies and products to meet your individual requirements:

### RFID (Radio-Frequency Identification)

We offer RFID technologies that enable you to track and manage items and assets efficiently. Our solutions include RFID readers, antennas and customized transponders tailored specifically to your application. We also have expertise in sensor transponders. These offer advanced functions, including pressure, temperature and humidity sensors. Such transponders allow real-time monitoring and data collection in various applications, from warehousing to quality assurance.

We support a variety of frequency ranges, standards and wireless protocols to ensure we can provide the right technology for your requirements:

- HF (High Frequency, ISO 14443, 15693)
- NFC (Near Field Communication)
- UHF (Ultra High Frequency, ISO 18000-63C)
- RAIN RFID

Whether NFC for reading an intelligent type plate, UHF for recording thousands of products in logistics tracking or HF as a standard for access control, Kathrein offers a customized solution.

### BLE (Bluetooth Low Energy)

Our Bluetooth Low Energy solutions, including transponders and beacons, enable precise localization, tracking and access control. This technology offers high accuracy and efficiency when tracking assets or people indoors and outdoors. We support the latest standards from Bluetooth 4.0 to 5.2.



E-bike tracker with BLE technology



Ski gate with BLE technology

## RTLS (Real-Time Location Systems)

Our RTLS solutions enable highly precise localization and tracking of objects, almost in real time. RTLS technology works using UWB and offers a variety of different measurement methods, each of which can be ideally configured for your application. The different methods "Angle of Arrival" (AoA), "Time of Flight" (ToF) and "Time Difference of Arrival" (TDoA) differ in terms of speed, precision, energy efficiency and outdoor capability.

## > Development process

Our approach to providing customized solutions follows a structured process consisting of six main phases:

### 1. Evaluation

- Analysis of specific customer requirements and objectives
- Selection of the appropriate technical and economic solution based on RAIN RFID, Bluetooth and/or UWB RTLS

### 2. Conceptualization

- Creation of the system architecture with regard to individual antennas, transponders, hardware and embedded software
- Determination of the development effort and creation of a project plan
- Consideration of all product-specific aspects, from functionality to design

### 3. Simulation - (Virtual) Proof of Concept

- Proof of concept to determine the feasibility of the planned project in our in-house test center
- Optional virtual proof of concept with complex simulation software
- Creation of a robust project concept

### 4. Development

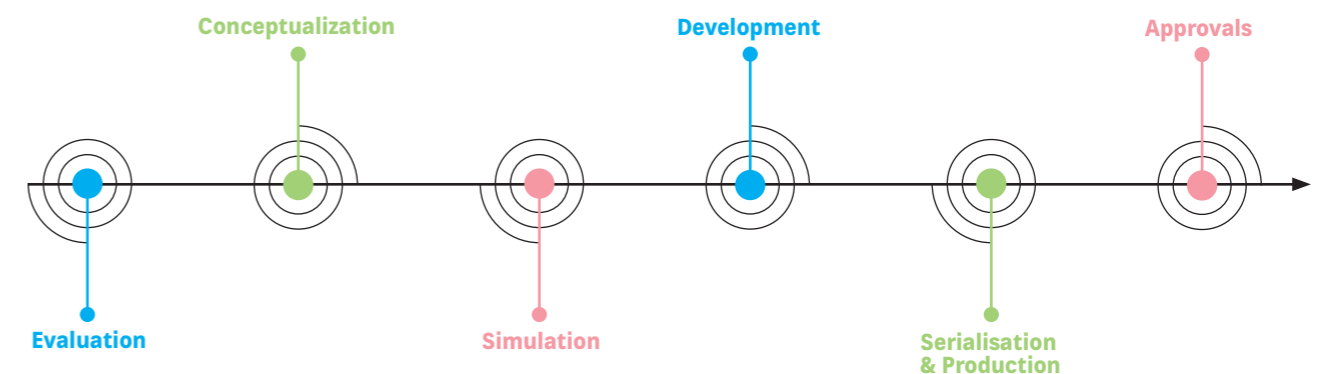
- Putting the concept into practice: development of a high-quality product that meets the specific requirements
- Continuous testing of development results with state-of-the-art EM simulation tools and measurement capabilities

### 5. Serialization and production

- Preparation of the product for mass production
- Sample production, measurements, performance testing in the real environment, comparison with the simulations
- Production of the developed products; ensuring quality with regard to their specific properties
- After-sales support

### 6. Approvals

- If required: complete takeover of approval activities
- Access to worldwide testing laboratories for competent and prompt certification



## > Development process in detail

### Concept phase

We offer our partners expert advice from concept development to series production of specific OEM products and solutions. Our many years of experience in the development of wireless identification and localization systems enable us to analyse specific OEM customer requirements and work with you to select the most suitable technical and economic solution based on RAIN RFID, Bluetooth and/or UWB RTLS.

### Development of a solution

Once the specification and offer have been confirmed, the development phase begins. The first step is to create a detailed project plan with an overview of the necessary phases and milestones as well as the desired completion date. During development, the progress of the work carried out and the results are regularly reviewed. A special case is the development of customer-specific OEM RAIN RFID transponders, which are integrated into various end products. State-of-the-art EM simulation tools and measurement options are used to ensure that the antenna concepts and OEM RAIN RFID transponders function optimally.

### Approvals

In addition to the development and production of customer-specific solutions, we can also take on all approval activities for you worldwide if required. We have a network of test laboratories on all continents, which enable us to issue certificates competently and promptly.

### System architecture

A detailed system architecture is created for the selected concept solution, which includes the necessary electronic components. Project-specific antennas, hardware and embedded software are coordinated with you and defined in specifications. In this phase, the amount of our development effort is determined and a corresponding offer for the end product is prepared.

### Production from our own hands

A major advantage of the solutions we develop is that we can also manufacture them directly for you. This not only guarantees a smooth transition from development to production, but also a very high quality of the products, which are 100% tested for their specified properties and requirements.

### After Sales Support

As soon as the products have been delivered to the customer, we offer you comprehensive support options to ensure the constant availability of your system.



Anechoic chamber for automated transponder measurements and test areas for eKanBan and gate solutions

## > R&D services – Specific products and solutions

### Readers

- HF/UHF RFID readers
- UWB/BLE node
- Concept development
- Customized integration
- Type approvals

### Antennas

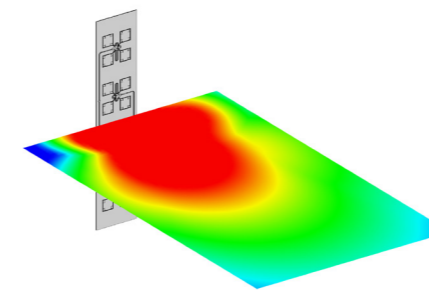
- UHF, HF antennas
- BLE, UWB antennas
- High gain and multi-polarization antenna
- Application-specific phased arrays
- Development in the range 13 MHz – 8 GHz

### Transponders

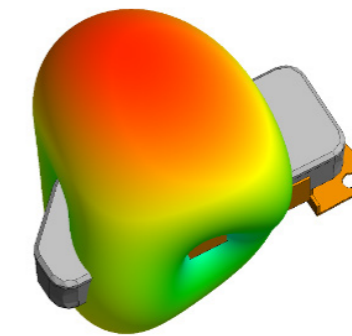
- HF (NFC) and UHF transponders
- UWB, BLE transponders
- Robust IP67 solutions
- Virtual PoC and application safeguarding with 3D field simulations
- High-security windshield label and headlamp tags

### Software/Firmware

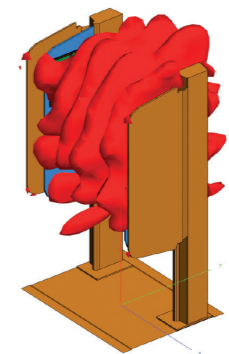
- Country profile development
- Customized firmware adaptations
- Application-specific read/write commands
- Real-time localization and direction detection



Gate solution with EDGE Line antennas



BLE E-Bike Tracker with mounting plate



BLE access solution

## > R&D: Order overview

Order number	Name	Description
52010548	R&D hardware	Development of OEM RAIN RFID readers in accordance with customer requirements and specifications
52010549	R&D antenna	Development of OEM RAIN RFID antennas in accordance with customer requirements and specifications
52010550	R&D firmware	Development of specific firmware adaptations in accordance with customer requirements and specifications
52010654	R&D transponder	Development of OEM RAIN RFID special transponders in accordance with customer requirements and specifications

> **Cooperation with sparring partners**

**IDePLATE – the label of tomorrow**

The IDePLATE® imprinted aluminum RFID label is equipped with a forgery-proof, theft-proof data chip, making it an outstanding solution for the future. The IDePLATE® guarantees reliable and secure identification of vehicles in stationary and moving traffic, irrespective of traffic volume, weather conditions, vehicle model and speed.



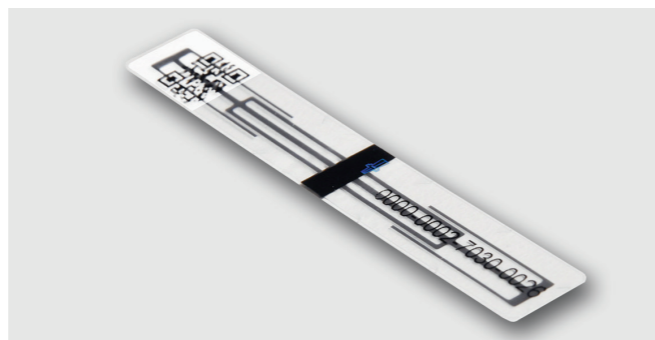
**IDeSTIX – Efficient. Modern. Uncomplicated.**

IDeSTIX is a high-quality security sticker with integrated RAIN RFID chip, which works according to the same principle as the IDePLATE. In combination with the electronic number plate, the protection against forgery is improved many times over. IDeSTIX® can be used as an alternative to the IDePLATE® RFID license plate, but can also be used in addition to it, which increases the security level even further.



**IDeSTIX Headlamp Tag – the electronic label for motorbikes**

IDeSTIX is a high-quality security sticker with integrated RAIN RFID chip, which works according to the same principle as the IDePLATE. In combination with the electronic number plate, the protection against forgery is improved many times over. IDeSTIX® can be used as an alternative to the IDePLATE® RFID license plate, but can also be used in addition to it, which increases the security level even further.



> **Customized solutions with partners**

**Axess – BLE-Ski Gate**

Kathrein Solutions and Axess have jointly developed the advanced BLE Ski Gate. The AX500 Smart Gate NG BLE enables online ticket purchase and loading of the ticket into the user app. As soon as the skier is in the reading area of the gate, the cell phone connects automatically, the ticket is checked and the gate opens contactlessly. Kathrein Solutions' innovative antenna system enables precise position detection and maximum gate performance.



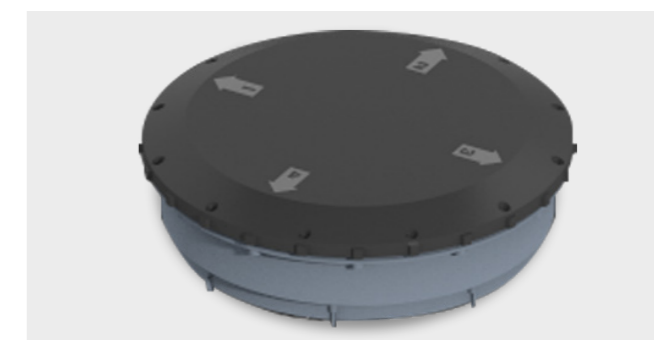
**Corratec – e-bike tracker „C-Finder“**

The e-bike tracker (transponder) enables e-bikes to be localized via the Apple Find-My network. It is fully integrated in the motor cover area and is powered by the e-bike's battery during the normal charging process. This means that it can be used by the end customer throughout the entire life cycle of the bike. In addition, the so-called C-Finder also has its own battery, which ensures operation without recharging for up to one year.



**Tönnjes – IDeREADER InRoad**

The IDeREADER InRoad is a special device for detecting vehicles in road traffic. It is embedded directly in the road, thus eliminating the need to install readers using cost-intensive gantries. The InRoad Reader has an integrated antenna with the option of switching in four directions and is therefore also suitable for direction detection. The complete InRoad Reader unit consists of the actual reader unit, an insert for vibration damping and the shaft housing.





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**KATHREIN**