RFID UHF Products 2010

Antennas

Antenna-integrated readers

Readers

KATHREIN
RFID

Contents

RFID General

RFID (Radio Frequency Identification) enables non-contact communication with an RFID data carrier.

In the process, digital information can either be read from the data carrier or written to it.

Kathrein develops and manufactures the required writer/reader units and antenna systems.

In general, RFID technology
is grouped into three frequency ranges:

- **LF-RFID: 125 kHz**
- **HF-RFID: 13.56 MHz**
- **UHF-RFID: 865-928 MHz**

Due to many years of experience in the UHF range, Kathrein is specialized in RFID systems in the UHF range.

Antennas

Antenna-integrated readers

Readers

RFID from Kathrein

As the leading manufacturer of antennas, Kathrein has been active in the field of RFID for over 25 years and possess comprehensive knowledge and experience in the area of UHF antennas, as well as in the processing and distribution of analogue and digital signals.
Kathrein have applied their comprehensive know-how gained in the field of automobile and mobile communications technology for quick and efficient development of OEM-specific RFID antennas and reader solutions.
A 3-D field simulation enables calculation and optimisation of complex antenna alignments with their respective tags.

Thus, it is possible to make a precise prediction on the system's capability.

Time-consuming, at times unsuccessful testing is therefore practically unnecessary, simplifying the development of customised products to a high degree.

Kathrein specializes in the UHF frequency range.

Our products comprise:

- Antenna systems
- Stationary reader systems
- Active antenna systems

Core competencies

- Development and manufacturing of UHF antennas and reader systems
- Customized UHF antenna systems
- Customized stationary readers and reader modules

KATHREIN
RFID

Kathrein-RFID GmbH Amerang

KATHREIN-RFID GmbH
A Kathrein Group company

Since the establishment of Kathrein-RFID GmbH in Amerang, our customers can rely on a professional partner for the implementation of their projects.

Kathrein-RFID GmbH's field of activity includes assistance in the design and analysis of RFID UHF-based systems.

The main fields of application are industrial automation and RFID in vehicle registration systems.
The company features a modern trial and testing laboratory for this purpose. The laboratory is equipped with modern antenna measuring stations and a high-speed conveyor, enabling testing of applications that are critical in terms of time and speed.

In order to ensure customer-oriented support, on-site assistance is also provided.

Antennas

Antenna-integrated readers

Readers

RFID Applications

RFID in industrial use

RFID is particularly suitable for use in industrial automation, to control and optimise manufacturing processes. An extension of its use into internal logistics is a further step for successful introduction of RFID systems.
This makes very wide demands on an RFID system. A wide variety of antenna systems is available so as to achieve the desired read range at the various reading points. The Kathrein RFID UHF technology allows even typically varied RFID HF applications to be satisfied with only one single medium.
There is no longer any need to change the transponder within the production and internal logistics environment.
This opens up entirely new possibilities for design and layout of automatic ID processes, which mean the desired ROI is achieved more quickly.

RFID in medical technology

New demands posed by legislation, and the desire to increase efficiency, necessitate the use of RFID in the field of production of pharmaceutical drugs.
The RFID UHF low range antenna systems developed by Kathrein allow the successful use of less expensive UHF transponders for this purpose for the first time.
There is no longer any need to switch from HF/barcode to UHF within the production and internal logistics environment.
A uniform medium can be used consistently across all tasks. The extremely small and robust design of the antennas permits quick and easy integration into the existing system.
Special reader-parameter sets have been created for this application; these ensure simple and effective parameterisation of the readers.

RFID in industrial use

RFID in medical technology

RFID Applications

RFID in logistics

Kathrein offers products and solutions specially designed for efficient delivery of RFID systems in the field of logistics. The very large number of transponders already in use for logistics demand very high-performance evaluation electronics, capable of recording as many as several hundred transponders quickly and reliably. For these requirements there are optimised process profiles available, which allow users to quickly parameterise their entire system.
Kathrein portal antennas are the world leaders in this field; they provide uninterrupted coverage of the field in the read range.

RFID for vehicle identification

RFID UHF is particularly well suited to the identification of vehicles, as its large range of up to 10 metres allows a multitude of possible applications.

Due to Kathrein's many years of experience in the field of integrated vehicle antennas, the business has the necessary know-how to make effective use of systems to identify transponders in the vehicle environment.

The ARU4 read/write device has been specially developed for this application field. It provides an efficient and cost-effective solution for integration of RFID technology into safety and access systems.
The high protection class and the robust design ensure a long working life at extremely low operating costs.

RFID in logistics

RFID for vehicle identification

RFID Products

RFID Antennas

RFID antennas are divided into three different categories; the choice of the right antenna will depend on the application.

Kathrein's antenna program includes the following types:

Antenna concepts

WIRA Wide Range Antennas	MIRA Mid Range	LORA Low Range Antennas
Far-field applications	Applications in radiating near field or far field	Applications in reactive near field
Versions with 30° or 70° beamwidth	Small dimensions	Extremely small dimensions
Maximum radiated power of 2 W ERP	Reading range limited by 0.5 W ERP	Very low gain
Wide read range up to 10 m	Typ. read range: 20 cm to 2 m	Reading distance < 20 cm
Selectivity dependent upon reading distance	Selectivity dependent upon reading distance	Extremely high selectivity
		Not influenced by metal

Wide Range Antennas

Mid Range Antennas

Low Range Antennas

RFID Antenna Overview

Wide Range Antennas:

Type number	Frequency range	Beamwidth	Protection class
520 10003	865-870 MHz	30° circular	IP 54 ruggedized
520 10004	865-928 MHz	55° circular	IP 54 ruggedized
520 10060	865-870 MHz	70° circular	IP 54
520 10073	902-928 MHz	70° circular	IP 54
520 10078	865-870 MHz	70° circular	IP 67
520 10079	902-928 MHz	70° circular	IP 67
520 10080	865-870 MHz	30° circular	IP 67
520 10081	902-928 MHz	30° circular	IP 67
520 10086	865-870 MHz	30° circular	IP 65 ruggedized
520 10087	902-928 MHz	30° circular	IP 65 ruggedized

Mid Range Antennas:

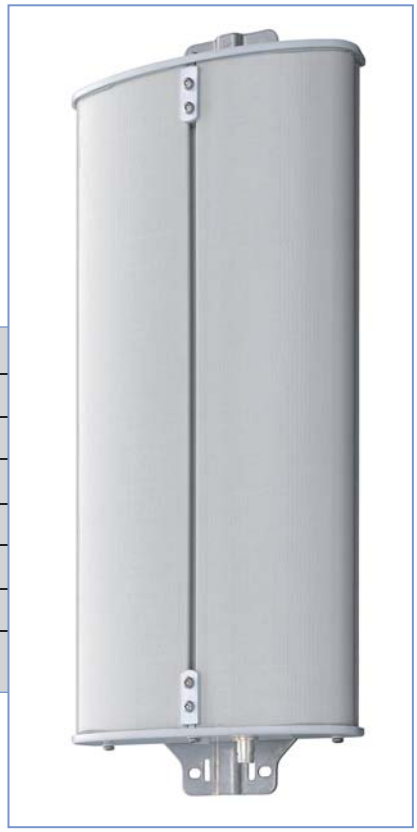
Type number	Frequency range	Beamwidth	Protection class
520 10082	865-870 MHz	100° circular	IP 67
520 10083	902-928 MHz	100° circular/linear	IP 67

Low Range Antennas:

Type number	Frequency range	Beamwidth	Protection class
520 10084	865-870 MHz	Near field	IP 67
520 10085	902-928 MHz	Near field	IP 67
520 10092	865-928 MHz	Near field	IP 67

RFID Products

RFID Wide Range Antenna Overview



Order no. **520 10003**

General Data

Frequency range	865-870 MHz
Beamwidth	30°/70°
Antenna gain	10.5 dBic
Axial ratio	3 dB
Polarization	Circular
Connection	N-type socket
Protection class	IP 54
Dimensions	555 x 262 x 59 mm

Order no. **520 10004**

General Data

Frequency range	865-928 MHz
Beamwidth	65°/55°
Antenna gain	8 dBic
Axial ratio	3 dB
Polarization	Circular
Connection	N-type socket
Protection class	IP 54
Dimensions	310 x 261 x 59 mm

RFID Wide Range Antenna Overview

Order no. **520 10060**

General Data

Frequency range	865-870 MHz
Beamwidth	68°/70°
Antenna gain	8.4 dBic
Axial ratio	2 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 54
Dimensions	243 x 290 x 60 mm

Order no. **520 10073**

General Data

Frequency range	902-928 MHz
Beamwidth	68°/70°
Antenna gain	8.2 dBic
Axial ratio	2 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 54
Dimensions	243 x 290 x 60 mm

RFID Products

RFID Wide Range Antenna Overview

Order no. **520 10078**

General Data

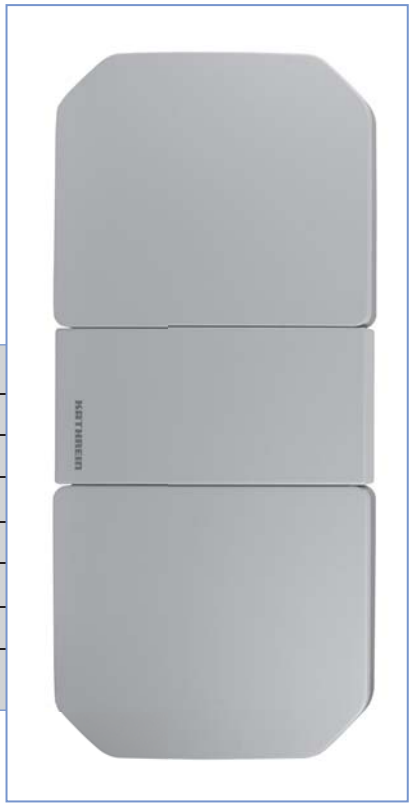
Frequency range	865-870 MHz
Beamwidth	69°/69°
Antenna gain	8.5 dBic
Axial ratio	1 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 67
Dimensions	270 x 270 x 45 mm

Order no. **520 10079**

General Data

Frequency range	902-928 MHz
Beamwidth	69°/69°
Antenna gain	8.3 dBic
Axial ratio	1 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 67
Dimensions	270 x 270 x 45 mm

RFID Wide Range Antenna Overview



Order no. **520 10080**

General Data

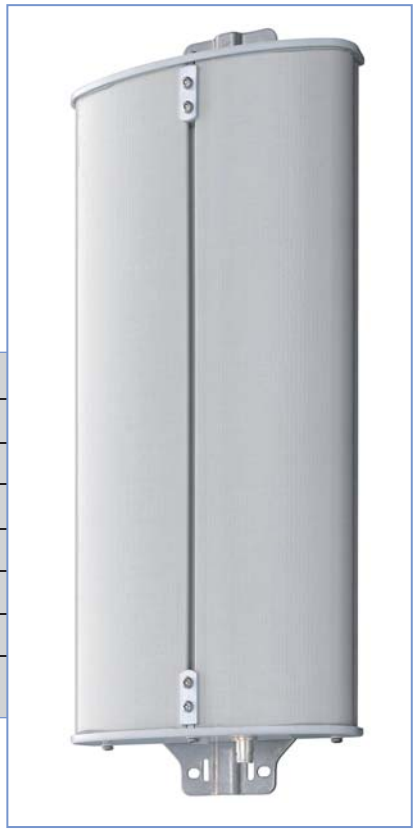
Frequency range	865-870 MHz
Beamwidth	30°/70°
Antenna gain	11.3 dBic
Axial ratio	1 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 67
Dimensions	580 x 270 x 45 mm

Order no. **520 10081**

General Data

Frequency range	902-928 MHz
Beamwidth	30°/70°
Antenna gain	11.0 dBic
Axial ratio	1 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 67
Dimensions	580 x 270 x 45 mm

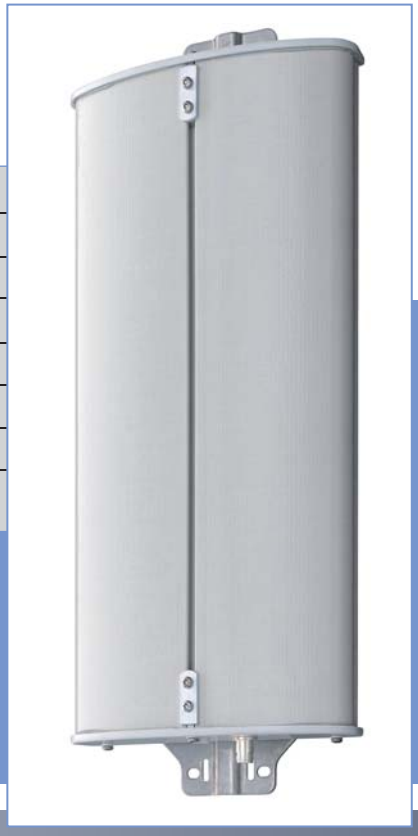
RFID Wide Range Antenna Overview



Order no. **520 10086**

General Data

Frequency range	865-870 MHz
Beamwidth	30°/70°
Antenna gain	11 dBic
Axial ratio	2 dB
Polarization	Circular
Connection	N-type socket
Protection class	IP 65
Dimensions	555 x 262 x 59 mm



Order no. **520 10087**

General Data

Frequency range	902-928 MHz
Beamwidth	30°/70°
Antenna gain	10.5 dBic
Axial ratio	2 dB
Polarization	Circular
Connection	N-type socket
Protection class	IP 65
Dimensions	555 x 262 x 59 mm

RFID Mid Range Antenna Overview

Order no. **520 10082**

General Data

Frequency range	865-870 MHz
Beamwidth	100°/100°
Read range	Typ. 0.2-2 meters
Antenna gain	4 dBic
Axial ratio	2 dB
Polarization	Circular
Connection	TNC socket
Protection class	IP 67
Dimensions	154 x 126 x 36 mm

Order no. **520 10083**

General Data

Frequency range	902-928 MHz
Beamwidth	100°/100°
Read range	Typ. 0.2-2 meters
Antenna gain	3.8 dBic/4 dBi
Axial ratio	2 dB
Polarization	Circular/linear
Connection	TNC socket
Protection class	IP 67
Dimensions	154 x 126 x 36 mm

RFID Low Range Antenna Overview

Order no. **520 10084** **LORA**

General Data

Frequency range	865-870 MHz
Read range	Typ. 7 cm @ NF tags *
Selectivity	Typ. 5 cm @ NF tags *
EIFF	> 20 dB
Antenna gain	< -15 dBi
Connection	TNC socket
Protection class	IP 67
Dimensions	90 x 63 x 31 mm

Order no. **520 10085** **LORA**

General Data

Frequency range	902-928 MHz
Read range	Typ. 7 cm @ NF tags *
Selectivity	Typ. 5 cm @ NF tags *
EIFF	> 20 dB
Antenna gain	< -15 dBi
Connection	TNC socket
Protection class	IP 67
Dimensions	90 x 63 x 31 mm

RFID Low Range Antenna Overview

Order no. **520 10094** **ULORA**

General Data

Frequency range	865-928 MHz
Read range	Typ. 3 cm @ NF tags *
Selectivity	Typ. 3 cm @ NF tags *
Read range	Typ. 8 cm @ FF tags **
Selectivity	Typ. 10 cm @ FF tags **
EIFF	> 15 dB
Antenna gain	< -30 dBi
Connection	TNC socket
Protection class	IP 67
Dimensions	90 x 63 x 31 mm

* Near field tags
** Far field tags

RFID Products

RFID Reader System Overview

Kathrein offers two different reader concepts. The stationary reader series RRUI4 is designed to be used with up to four external antennas and provides the highest degree of flexibility. Due to its compact construction, the device can be easily integrated into existing systems.

The RRU4 series features a broad range of options and interfaces. Thanks to its IP 65 housing, it is suitable for outdoor use.

The ARU4 readers form an assembly with their built-in WIRA antennas. This series has been designed for typical 'single read point' applications. The optional external antenna outputs also allow three additional external antennas to be supplied.

Reader Concepts

RRUI4
Stationary readers

Near field/far field applications

Compact construction

Flexible antenna configuration

Read distance: up to 10 m

Max. radiated power 2 W ERP

RRUI4

RRU4
Stationary readers

Near field/far field applications

Compact construction

Flexible antenna configuration

Read distance: up to 10 m

Max. radiated power 2 W ERP

RRU4

ARU4
Antenna-integrated readers

Far field applications

Compact construction

Various antenna configurations

Read distance: up to 10 m

Max. radiated power 2 W ERP

ARU4

RFID Reader System Overview

RRUI4:

Type number	Name	Frequency range	Performance class	Interface	Protection class
520 10009	RRUI4-RS4-E4	865-870 MHz	Max. 2 W ERP	USB/RS 485	IP 40
520 10017	RRUI4-ETH-E4	865-870 MHz	Max. 2 W ERP	USB/Ethernet	IP 40
520 10025	RRUI4-RS4-U4	902-928 MHz	Max. 4 W EIRP	USB/RS 485	IP 40
520 10027	RRUI4-ETH-U4	902-928 MHz	Max. 4 W EIRP	USB/Ethernet	IP 40

RRU4:

Type number	Name	Frequency range	Performance class	Interface	Protection class
520 10093	RRU4-RS4-E6	865-870 MHz	Max. 2 W ERP	RS 485	IP 65
520 10094	RRU4-ETG-E6	865-870 MHz	Max. 2 W ERP	Ethernet / GPIO	IP 65
520 10095	RRU4-ETL-E6	865-870 MHz	Max. 2 W ERP	Ethernet/GPIO/LINUX	IP 65
520 10096	RRU4-RS4-U6	902-928 MHz	Max. 4 W EIRP	RS 485	IP 65
520 10097	RRU4-ETG-U6	902-928 MHz	Max. 4 W EIRP	Ethernet/GPIO	IP 65
520 10098	RRU4-ETL-U6	902-928 MHz	Max. 4 W EIRP	Ethernet/GPIO/LINUX	IP 65

ARU4:

Type number	Name	Frequency range	Performance class	Interface	Protection class
520 10099	ARU4-RS4-E6	865-870 MHz	Max. 2 W ERP	RS 485	IP 65
520 10100	ARU4-ETG-E6	865-870 MHz	Max. 2 W ERP	Ethernet/GPIO	IP 65
520 10101	ARU4-ETL-E6	865-870 MHz	Max. 2 W ERP	Ethernet/GPIO/LINUX	IP 65
520 10102	ARU4-RS4-U6	902-928 MHz	Max. 4 W EIRP	RS 485	IP 65
520 10103	ARU4-ETG-U6	902-928 MHz	Max. 4 W EIRP	Ethernet/GPIO	IP 65
520 10104	ARU4-ETL-U6	902-928 MHz	Max. 4 W EIRP	Ethernet/GPIO/LINUX	IP 65

RFID Products

RRUI4 Platform

Frequency range	ETSI/FCC
Output power	30 dBm
Standards	EPC Global Gen2/ISO 18000-6C
Antenna interface	4-port RX/TX, TNC-reverse
Operating system	Kathrein firmware
Interfaces	USB/RS 485/Ethernet
Power supply	24 V DC ± 10 %
Operating temperature	-20 °C to +55 °C
Storage temperature	-20 °C to +85 °C
Protection class	IP 40
Dimensions	200 x 108 x 81
Conforms to	CE, FCC

RRU4 Platform

Frequency range	ETSI/FCC
Output power	33 dBm
Standards	EPC Global Gen2/ ISO 18000-6C
Antenna interface	4-port RX/TX, TNC-reverse
Operating system	Kathrein firmware
User platform	Linux platform optional
Interfaces	RS 485/Ethernet optional
Digital I/O	4 inputs/outputs optional
Operating temperature	-20 °C to +65 °C
Storage temperature	-20 °C to +85 °C
Protection class	IP 65
Dimensions	252 x 216 x 66 mm
Conforms to	CE, FCC, China

ARU4 Platform

Frequency range	ETSI/FCC
Output power	33 dBm
Standards	EPC Global Gen2/ ISO 18000-6C
Antenna interface	3-port RX/TX, TNC-reverse
Antenna integration	69°/69° circular
Operating system	Kathrein firmware
User platform	Linux platform optional
Interfaces	RS 485/Ethernet optional
Digital I/O	4 inputs/outputs optional
Operating temperature	-20 °C to +65 °C
Storage temperature	-20 °C to +85 °C
Protection class	IP 65
Dimensions	270 x 270 x 80 mm
Conforms to	CE, FCC, China

RRUI4

RRU4

ARU4

RFID Cable

In order to meet specific demands, Kathrein's product range not only includes standard cables, but also a wide selection of high-quality HF cables and plugs which can be assembled upon request.

TNC (f)-rev / N (m)

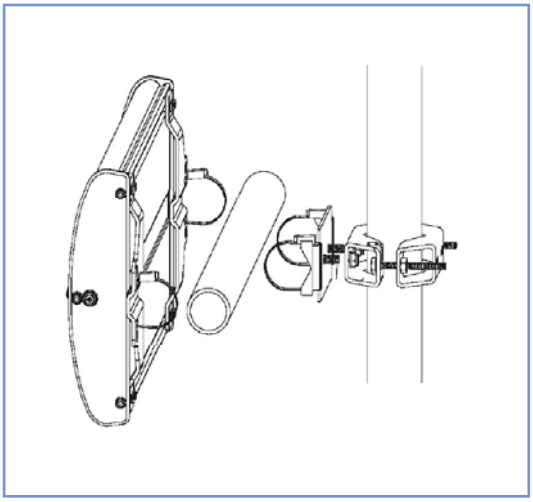
TNC (m)/TNC (f)-rev

Type number	Length in mm	Interface	Cable type
520 100 53	3000	TNC(f)-rev/TNC(m)	RG 58-PE
520 100 54	6000	TNC(f)-rev/TNC(m)	RG 58-PE
520 100 57	3000	TNC(f)-rev/N(m)	RG 58-PE *
520 100 58	6000	TNC(f)-rev/N(m)	RG 58-PE *
520 100 90	3000	SMA(m)/TNC(m)	RG 58-PE

*Cable with N(m) to TNC (f)-rev plug fits the following antennas: 520 10003/520 10004/520 10086/52010087

RFID Mounting Accessories

Antenna-specific
Wall/mast mounting systems



Type number	Description	Interface	Material
520 10005 *	Mast mounting set	Mast installation	Steel
520 10118 **	Mast mounting set/wall mount	Vesa compatible	Steel

* Mast mounting set 520 10005 is suitable for the following antennas: 520 10003/520 10004/520 10086/52010087
** Mast mounting set 520 10118 is suitable for the following antennas: 520 10078/520 10079/520 10080/520 10081

KATHREIN representatives

You will find an updated list of KATHREIN representatives on our website www.kathrein.de

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