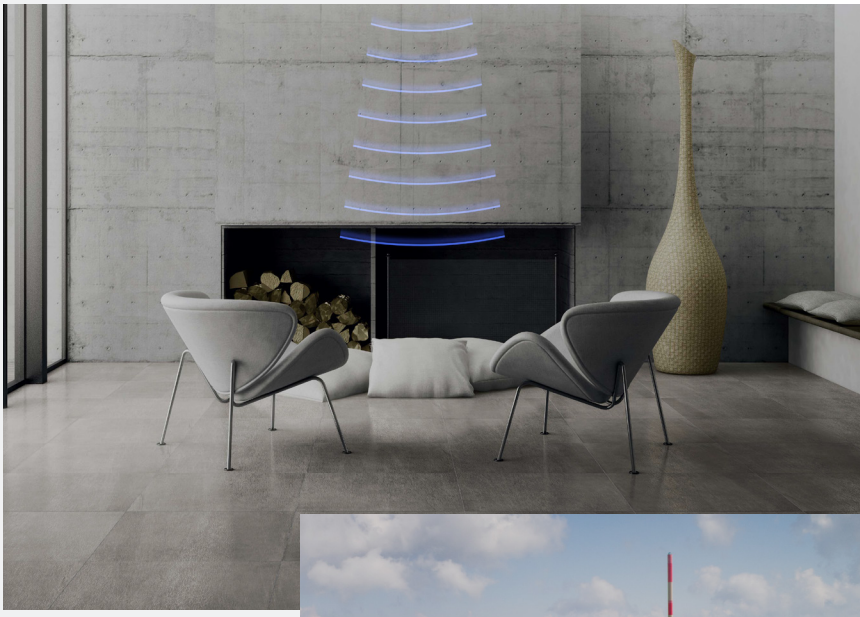
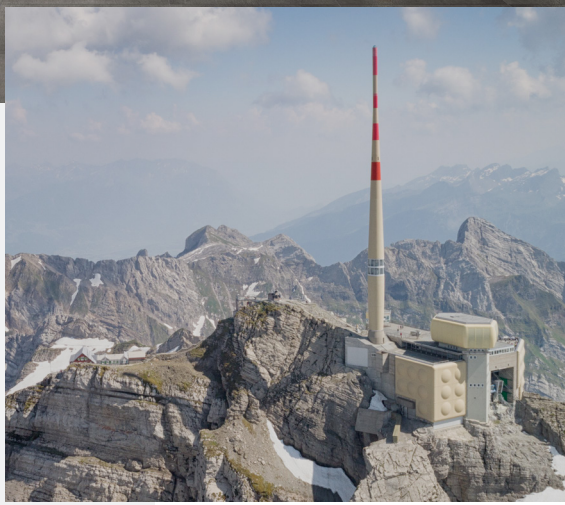

Leading supplier
of planar radar sensors
RFbeam Microwave
swiss radar solutions



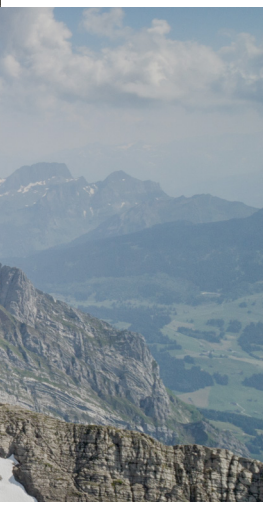


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Who we are

RFbeam Microwave GmbH is located in St.Gallen, Switzerland. We are your powerful and responsive partner for standard and customer specific Radar products, engineering services and application support. Manufacturing is provided by selected and ISO certified production partners. RFbeam Microwave GmbH is a reliable and creative partner with a worldwide customer base.



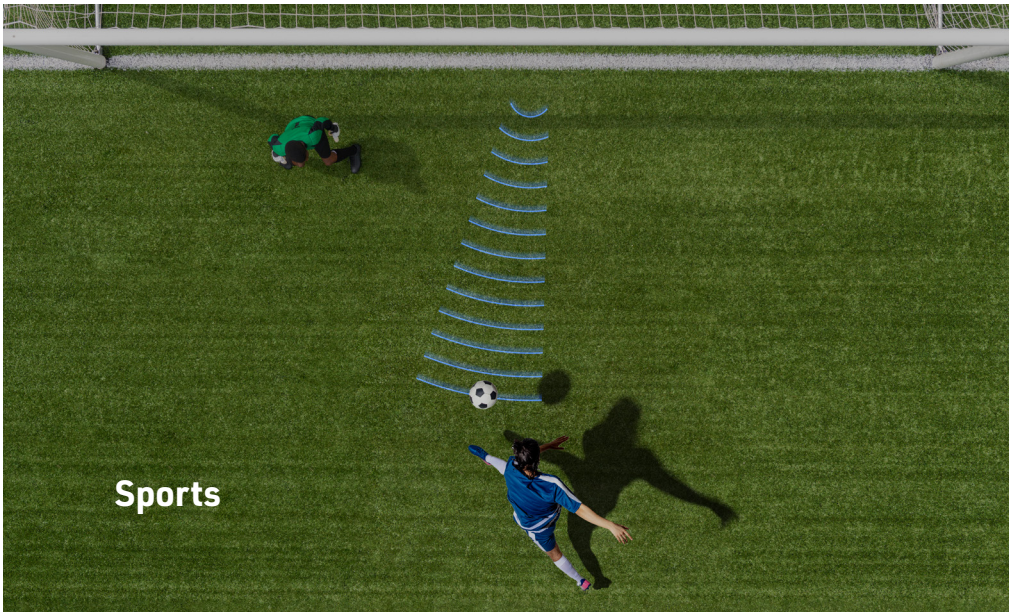
What we do

We develop and manufacture short range microwave sensors and solutions for industrial and OEM (original equipment manufacturer) customers. RFbeam is also a specialist in antenna design and general microwave circuit engineering. Our products are used in motion and industrial sensors, traffic monitoring and analyzer systems, sport measurement equipment and many other applications.

Why use radar

For several years, planar radar technology has enabled the realisation of small, cost effective and robust sensors. Radar is an inherently robust technology that can be used even under harsh environmental conditions. Our radar sensors are used for so called short range radar applications covering distances from centimetres to a few hundred metres.

Applications



Radar sensors are well suited for measurements in sporting activities. They can be hidden behind plastics and are usable in nearly all environmental conditions. Radar sensors can be used to track a wide variety of parameters in sports applications like velocity, distance and angle of objects.

- Velocity measurement
- Position detection
- Object tracking



RFbeam offers a wide range of sensors for use in traffic applications. Radar is known for its speed measurement capabilities. In addition, Radar can also measure direction, distance and angle of dynamic and static objects in all weather conditions. This makes radar the number 1 choice for many traffic applications.

- Speed measurement
- Counting and classification
- Cross section surveillance
- Inductive loop replacement
- Smart city
- Street lighting



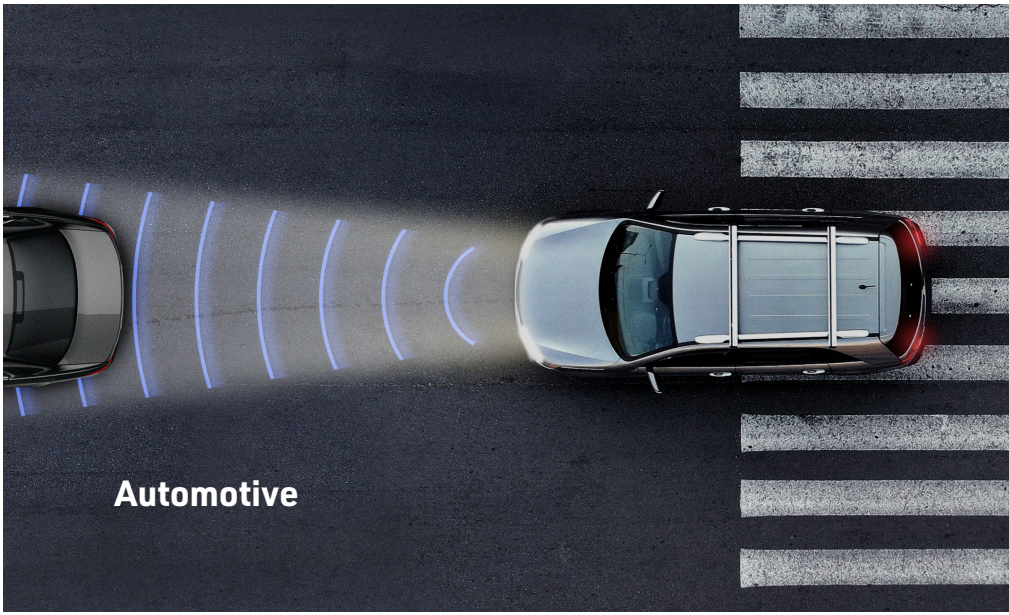
Radar sensors are the next big step for home automation applications. It is possible to detect and track objects in a room with a single sensor. The ability to hide the sensor behind plastic provides great design flexibility. Radar is completely anonymous, making it perfect for sensitive home automation applications.

- Person detection
- Elderly care
- IoT
- Gesture control
- Vital sign
- Touchless switch



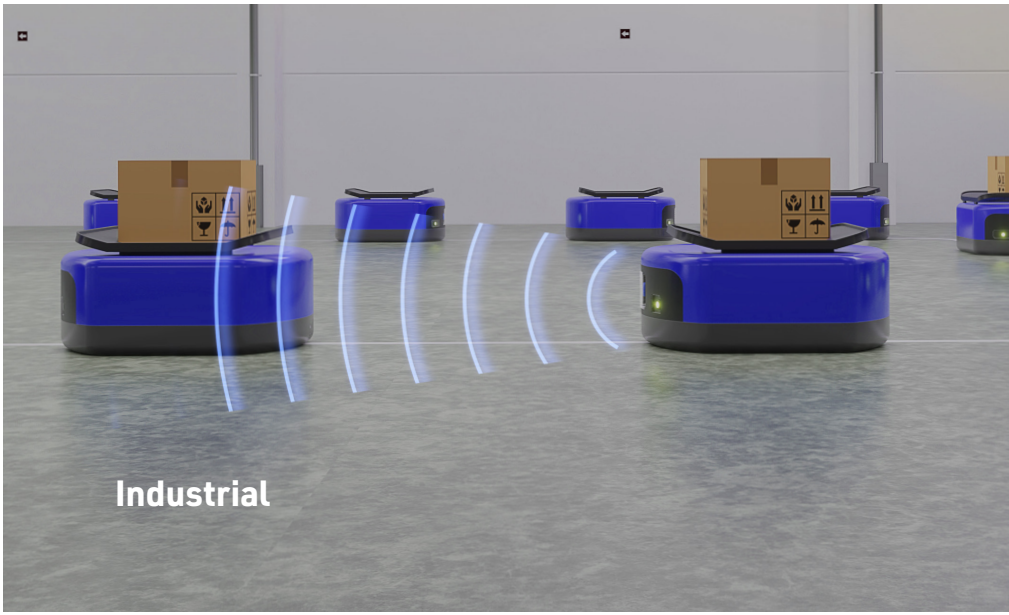
Security applications can benefit from the many advantages of Radar sensors. They are unaffected by environmental influences such as day, night, fog or smoke etc. and that combined with their anonymity makes them ideal for use in various security applications.

- Intrusion
- Perimeter protection
- Room surveillance



Radar technology has a long tradition in the automotive business. There are special frequency bands reserved only for automotive applications. RFbeam works with leading chip manufacturers to enable future-oriented solutions for your automotive application.

- Blind spot detection
- In cabin sensing
- Adaptive cruise control
- Imaging radar
- Gesture recognition



The robustness against environmental influences makes radar sensors perfectly suited for industrial applications. Radar sensors can generate 3D point clouds for periphery surveillance or precise measurements in the millimeter range for tank level applications.

- Periphery surveillance
- Tank level gauging
- Gesture detection
- Anti collision



Environmental

Radar sensors can provide important information about the environment and thus help to limit environmental damage. Being impervious to the weather enables early warnings in environmental applications.

- Avalanche detection
- Debris flow detection
- Water level and speed measurement

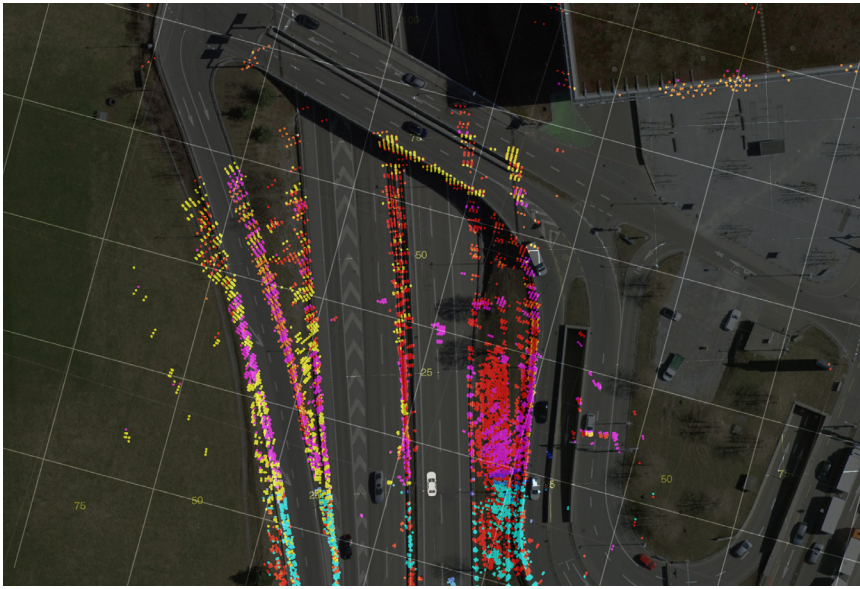


Drones are becoming increasingly intelligent and require reliable information about their surroundings to operate safely. In addition, drones also want to be able to be detected from the ground. Radar sensors can provide reliable data here.

- Drone detection
- Obstacle avoidance
- Altimeter

Engineering

RFbeam also provides engineering services. This includes the design of custom hardware, schematics and PCB-Layout work as well as production of prototypes and larger quantities. Our lab is equipped for measurements up to 110GHz. Do you need a custom antenna design? – Ask our antenna experts! Whether you are looking for standard antennas such as Patch or Horn or more complex Vivaldi or Sinuous designs, we can support you with proven solutions. Our hardware and software design experience covers the full range from microcontrollers to FPGA designs and fast signal processing algorithms. The design and fabrication of mechanical housings is also possible. Our design team works with state-of-the-art software.



Customized Products

Do you need a modified version of a RFbeam radar transceiver? – Whether the changes involve the size, the antenna pattern, the frequency or other electrical characteristics of the product, RFbeam is your partner for the design and customization of a Radar transceiver. Such a design includes cost optimization as well as industrialization, so your product can be produced and tested in small, medium or large quantities. If you are looking for more intelligent Radar transceivers including signal processing, our design team can assist you.

Standard Products

Our standard sensors can be used to measure different parameters like movement, direction, speed, distance and angle of motion as well as stationary objects. RFbeam also offers different starter kits and evaluation systems, which allows you to easily get familiar with the possibilities and advantages of radar technology. The sensors can be categorized into digital and analogue versions.

The digital sensors can be applied in an application with low additional effort as the signal processing is already integrated. Each sensor has a digital interface for parameter configuration or reading out of the measured values. The use of analogue sensors requires additional hardware and know-how in signal modulation and processing. Contact RFbeam to discuss the optimal solution for your specific needs.

Digital standard products

Integrated signal processing, digital interface

Name	Detection range person [m]	Detection range car [m]	Detection range water [m]	Moving targets	Stationary targets	Movement	Direction	Speed	Distance	Angle	Opening angle [Deg]	Typ. supply voltage [V]	Typ. supply current [mA]	Frequency band [GHz]
K-LD2	15	30		✓		✓	✓	✓			80×34	3.3 to 5	55	24
K-LD7	15	30		✓		✓	✓	✓	✓	✓	80×34	3.3 to 5	30	24
K-MD7	50	150		✓		✓	✓	✓	✓	✓	34×34	3.3 to 5	90	24
V-LD1*	20	50	50	✓	✓				✓		8×8	1.8	10	61
V-LD3	20	60		✓	✓	✓	✓	✓	✓	✓	110x50	1.8	10	61
V-MD3	30	80		✓	✓	✓	✓	✓	✓	✓	60×36	12 to 24	300	61
RFA1	10	20		✓		✓	✓				80×34	12	10	24
K-XC1	10	15		✓	✓				✓		25×12	24	300	24

* in combination with plastic lens

Analogue standard products

No signal processing included, analogue interface

Name	Detection range person [m]	Detection range car [m]	Moving targets	Stationary targets	Movement	Direction	Speed	Distance	Angle	Opening angle [Deg.]	Typ. supply voltage [V]	Typ. supply current [mA]	Frequency band [GHz]
K-LC1a	12	31	✓		✓		✓			80×34	3.3 to 5*	35	24
K-LC2	10	26	✓		✓	✓	✓			80×34	5	35	24
K-LC3	7	15	✓		✓		✓			138×132	3.3 to 5*	35	24
K-LC4	6	15	✓		✓	✓	✓			138×132	5	35	24
K-LC5	15	40	✓	✓	✓	✓	✓	✓		80×34	3.3 or 5*	75	24
K-LC6	24	62	✓	✓	✓	✓	✓	✓		80×12	3.3 or 5*	85	24
K-LC7	8	22	✓	✓	✓	✓	✓	✓	✓	80×34	3.3 to 5	90	24
K-MC1	56	150	✓	✓	✓	✓	✓	✓		25×12	3.3 or 5*	90	24
K-MC1_LP	50	140	✓		✓	✓	✓			25×12	3.3 to 5	7.5	24
K-MC3	70	180	✓	✓	✓	✓	✓	✓		25×7	5	90	24
K-MC4	37	93	✓	✓	✓	✓	✓	✓	✓	30×12	5	180	24
K-HC1	210	560	✓		✓	✓	✓			25×12	24	220	24

* depending on product variant

These are indicative values only and cannot be guaranteed.
Range depends on many parameters like size of object, direction of movement and data processing method.

Development tools

RFbeam also offers different development tools to ease and speed up the development process

Name	Description	Features
ST100	Analogue radar starter kit	– Compatible with analogue RFbeam sensors – Powerful GUI included – Analyzing Doppler frequency spectra – Measure movement, speed and direction of moving targets – Learning Doppler basics – Recording and playback of Doppler signals
ST200	Analogue radar evaluation system	– Compatible with analogue RFbeam sensors – Powerful GUI included – Analyzing Doppler frequency spectra – Measure movement, speed and direction of moving targets – Learning Doppler basics – Recording and playback of signals – Exploring ranging techniques like FSK and FMCW – Exploring monopulse techniques for angle measurement
RSP1	Radar signal processor	– Signal processor to use in combination with analogue sensors – Can measure movement, speed and direction of moving targets – Directly integrable in end product – Highly configurable for different applications
K-TS1	24GHz Radar frontend test system	– Simple radar test system – 23 to 25GHz frequency range – Can measure the frequency and power of a DUT – Doppler target simulator included – Easy configuration and measurement over GUI
K-DT1	24GHz Radar Doppler target simulator	– Simple battery powered Doppler target simulator – Designed for 24GHz radar sensors – Can be used for calibrating and testing of radar sensors

Evaluation kits

In order to simplify the use of our sensors, we have also various evaluation kits in our portfolio

Name	Description	Features
RSP1-EVAL	RSP1 evaluation kit	– Evaluation PCB with integrated RSP1 – Integrated IF amplifiers and potentiometer – Compatible with analogue RFbeam sensors – Powerful GUI for visualization and configuration – Perfect for fast application prototyping
K-LD2-EVAL	K-LD2 evaluation kit	– Evaluation PCB with K-LD2 sensor – Integrated potentiometers and leds – Powerful GUI for visualization and configuration – Evaluate movement detection and speed measurement
K-LD7-EVAL	K-LD7 evaluation kit	– Evaluation PCB with K-LD7 sensor – Integrated leds to signal detection – Powerful GUI for visualization and configuration – Evaluate distance and angle triggered movement detection
K-MD7-EVAL	K-MD7 evaluation kit	– Evaluation PCB with K-MD7 sensor – Integrated leds to signal detection, – Powerful GUI for visualization and configuration – Easy evaluation of sensor functionality
V-LD1-EVAL	V-LD1 evaluation kit	– Evaluation PCB with V-LD1 sensor – 8° to 8° detachable plastic lens included – Up to 50m detection range for water – Powerful GUI for simple evaluation
V-LD3-EVAL	V-LD3 evaluation kit	– Evaluation PCB with detachable V-LD3 sensor – Preprogramed with TI's motion and presence demo – Provides access to SPI, UART, JTAG, and CAN interfaces – Enables simple evaluation for multiple applications
V-MD3-EVAL	V-MD3 evaluation kit	– V-MD3 with cables and power supply – Simple to directly connect to a PC – Powerful GUI for visualization and configuration – Evaluate range Doppler processing and multi target tracking

Further information

Detailed information on all RFbeam products, datasheets and short form descriptions can be found on our website **www.rfbeam.ch**

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