

RFbeam Microwave GmbH

leading supplier of planar radar sensors
K-band measuring equipment and engineering



I Who we are

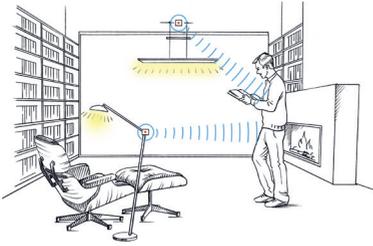
RFbeam Microwave GmbH is situated in St.Gallen, Switzerland. We are your powerful and responsive partner for standard and customer specific Radar products, engineering services and application support. Manufacturing is provided by selected and ISO certified production partners. RFbeam Microwave GmbH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

I What we do

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

I 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.

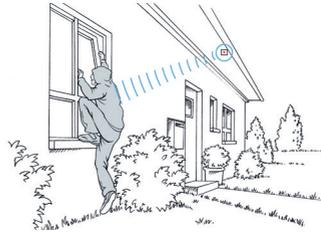


Indoor Automation

- Automatic light activation
- Air-conditioning active if room is occupied
- Conserve energy
(never forget to switch off the light)
- Comfort function (no light switch necessary)

Intrusion Alarm

- Detection movement in room
- Measure distance to object
- Detect unwanted opening of windows
- Perimeter protection

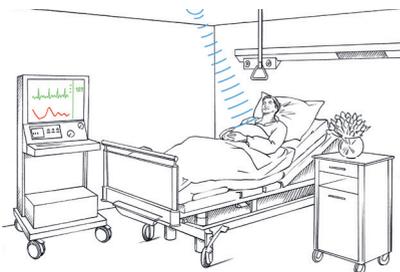
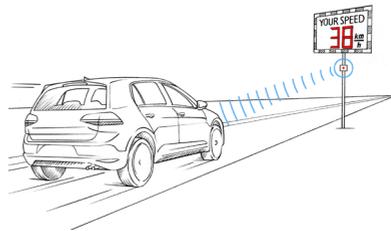


Movement Detection

- Activate light on advertising boards
- Attract attention to an object
- Illuminate elevator panel
- Count number of persons

Speed Measurement

- Inform driver of his actual speed
- Measure distances between vehicles
- Classify vehicles
- Enforcement sensors



Vital Sign Monitoring

- Measure heartbeat
- Breathing rate
- Bedside monitoring
- Elderly care

I 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 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.

I 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 a product, RFbeam is your partner to design a customized version of a Radar transceiver. Such a design includes cost optimization as well as the 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.

I Standard Products

Our primary business is volume sales of radar transceiver units to OEM customers. RFbeam standard products cover many applications in the 24GHz band. This standardized frequency allows the license-free usage of our products. RFbeam also has many starter kits and evaluation-systems, what allows you to quickly learn the possibilities and advantages of radar technology. Our standard products are available through our distributors or directly from RFbeam in Switzerland.

Parameters

Modules	Supply Voltage [V]	Channels	Opening Angle [Deg]	Detection Range Person [m]	Detection Range Car [m]	Frequency Band [GHz]	VCO	Size [mm]	Integrated Signal Processing
K-LC1a	5	1	80×34	12	30	24	✓	25×25×6	
K-LC1a_V2	5	1	80×34	12	30	24		25×25×6	
K-LC1a_V4	3.3	1	80×34	12	30	24	✓	25×25×6	
K-LC1a_V5	3.3	1	80×34	12	30	24		25×25×6	
K-LC2	5	2	80×34	12	30	24	✓	25×25×6	
K-LC3	5	1	138×132	7	15	24		25×25×6	
K-LC3_V2	3.3	1	138×132	7	15	24		25×25×6	
K-LC5	5	2	80×34	25	25	24	✓	25×25×6	
K-LC5_V2	5	2	80×34	25	60	24		25×25×6	
K-LC5_V3	3.3	2	80×34	25	60	24	✓	25×25×6	
K-LC6	5	2	80×12	35	80	24	✓	65×25×6	
K-LC6_V2	5	2	80×12	35	80	24	✓	65×25×6	
K-LD2	3.3/5	2	80×34	20	60	24		25×25×6	✓
K-MC1	5	2	25×12	60	150	24	✓	65×65×7	
K-MC1_LP	3.3/5	2	25×12	60	150	24		65×65×7	
K-MC3	5	2	25×7	70	180	24	✓	105×85×7	
K-MC4	5	2	30×12	40	100	24	✓	78×78×7	
K-MC5_LP	3.3/5	2	6×5	40	100	24		187×144×10	
K-MD1	12	4	30×12	80	250	24	✓	120×72×16	✓
K-MD2	12	6	30×21	80	250	24	✓	120×72×16	✓
K-HC1	24	2	25×12	400	1000	24	✓	110×77×19	
K-XC1	24	2	25×12	8	15	24	✓	89×77×19	✓
Spirit (MR2001)	12	6	11×11	50	300	77	✓	91×73×30	✓
Eagle (MR3003)	12	4	24×11	30	200	77	✓	76×44×35	✓
RFA1	12	1	80×34	12	30	24		44×44×10	✓
K-TS1	24	-	30×30	-	-	24	✓	103×76×11	
K-DT1	5	-	30×30	-	-	24		125×70×24	
K-FT1	12	-	30×30	-	-	24		200×200×50	✓

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.

Selection by application

There is no general rule for sensor selection. Each application has its own requirements. Please contact RFbeam to discuss the optimal solution for your specific needs.

Typical Applications

Product Family

	Indoor Automation	Intrusion-Alarm	Movement Detector	Speed Measurement	Vital Sign Monitoring	Blind spot detection	Cross section surveillance	Door opening	Street light	Others
Evaluation and starter kits	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RSPx Radar Signal Processors	✓	(✓)	✓	✓				✓	(✓)	✓
K-LCx Low complexity sensors	✓	✓	✓	✓	✓			✓	(✓)	✓
K-MCx Medium complexity sensors		✓		✓		✓			✓	✓
K-HCx High complexity sensors		✓		✓					✓	✓
Digital Radars K-XC1, K-MDx		✓	✓	✓		✓	✓		✓	✓
Test systems K-TS1, K-DT1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Development tools

ST100 Starterkit vs ST200 Evaluation Kit vs RSP1 Evaluation Kit

These kits allow learning radar basics and evaluating radar technology for your specific application. STxxx kits can save a lot of initial time and money in order to get first radar experience. While ST100 and ST200 allow signal analysis in more detail, RSP1 Evaluation Kit is oriented on practical implementation of movement sensors.

Purpose	ST100	ST200	RSP1	Comments
Learning Doppler basics	✓	✓	✓	
Developing movement sensors	✓	✓	✓	
Analyzing Doppler frequency spectra	✓	✓	✓	
Working with complex FFT and I/Q sensors		✓	✓	Important for separating multiple objects, suppressing interferences ...
Recording and playback of Doppler signals	✓	✓		
Analog output of recorded Doppler signals	✓			Very helpful for analyzing real world signals in the laboratory
Exploring FSK ranging		✓		Ranging of moving objects
Exploring FMCW ranging		✓		Ranging of moving and stationary objects
Exploring Monopulse principle		✓		Detect direction angle of moving objects

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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RFbeam reserves the right to change said products and specifications at any time and without notice.

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