Leuze

LBK
Safety radar system

Safety at Leuze

The Sensor People

Safe radar system LBK
Reliable area monitoring in harsh environments

The world’s first safe 3D radar system, LBK, was developed for monitoring hazardous areas in harsh industrial environments. It detects the bodies of persons and in doing so monitors the protected area for access and presence. Up to 6 sensors can be combined via one controller.

LBK – Safety radar system: LBK S/SBV

Depending on the application and environment, there are different sensors with different features to choose from.

Advantages for you

— Reliable operation, even under harsh environmental conditions with, e.g., dirt, dust, smoke, and light
— Flexible adaptation of the protected area to the application: Determine the number and position of the sensors, configure the length and opening angle / width of the area
— Static objects are permitted in the protective field and do not lead to the shutdown of the safety outputs
— Project planning and setup service for your application by our certified experts on request

Areas of application

— Guarding of hazardous areas in harsh environments
— Restart protection
— Monitoring of hidden areas

LBK ISC

As the second part of the safety radar system, a controller is required for evaluation, synchronization and signaling, but also for configuration purposes.
The LBK ISC controllers differ in the communication interface and an optional SD memory card for configuration.

Advantages for you

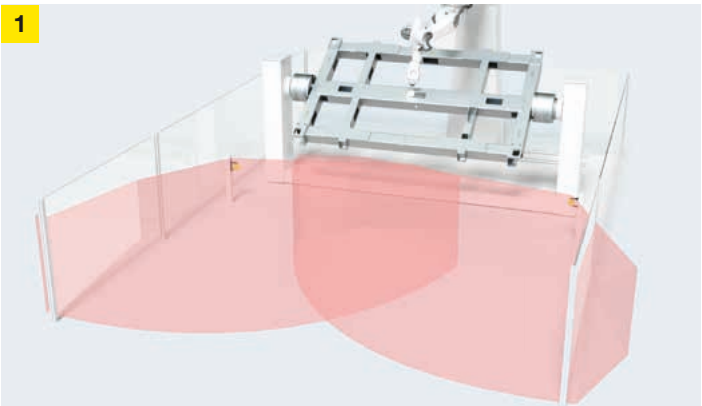
— Selection of different configuration interfaces
— Variants with optional secure and non-secure fieldbus connection
— OSSD and digital outputs
— Up to 6 sensors can be combined
— Configuration memory on SD card
— Fast integration due to simple system design and controller with PROFIsafe, CIP Safety or FSoE interface

Applications

Guarding of hazardous areas in harsh environments

Requirement: The hazardous working range of the machine is to be guarded against entry by and the presence of persons. Safe operation and high availability must also be guaranteed under harsh ambient conditions – such as dirt, welding sparks, sawdust or humidity.

1

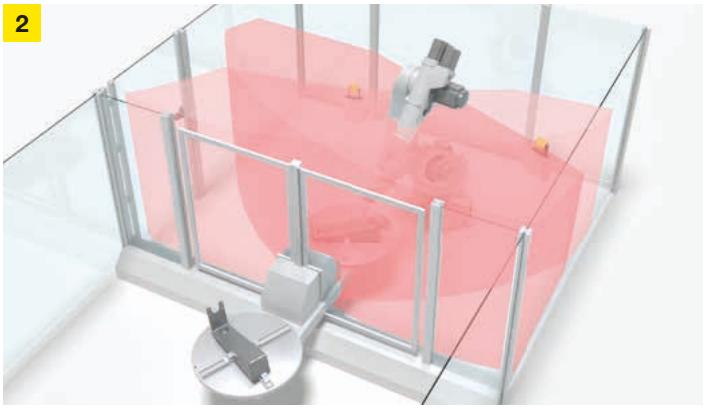


Solution: The LBK 3D safety radar system detects movements in the monitored area and operates reliably even under harsh ambient conditions. Furthermore, the radar technology allows the presence of static objects in the monitored area.

Restart protection and monitoring of hidden areas

Requirement: To prevent danger, the process may only be restarted once it has been ensured that no person is present in the working range or in the hidden area.

2

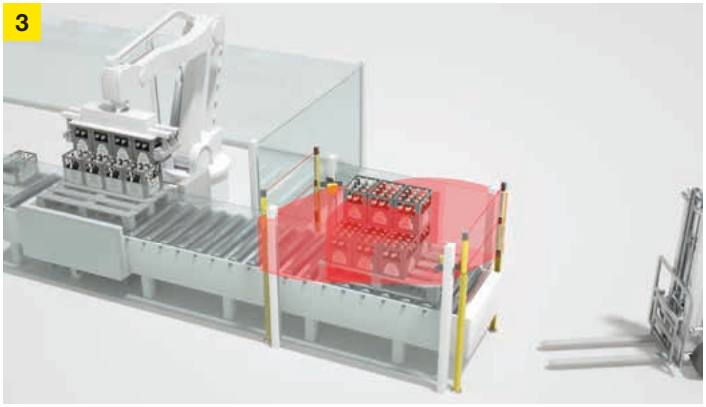


Solution: The LBK 3D safety radar system monitors the presence of persons in the protected area and operates reliably even under harsh ambient conditions. Furthermore, the radar technology allows the presence of static objects in the monitored area.

Access guarding at material transfer station

Requirement: The robot cell is fed automatically. The material is loaded onto the conveyor line, e.g. using a forklift truck, and then transported into the cell. Access to the cell must be safeguarded. For optimum capacity utilization of the robot cell, the safety concept must also allow uninterrupted operation of the cell during loading.

3



Solution: The loading area of the conveyor line is guarded at both the feed and outfeed side by multiple light beam safety devices. The area between the photoelectric sensors is monitored for the presence of persons by safety radar sensors.

Monitoring of hidden areas in machines

Requirement: The automatic machining process may only start when the machine openings are closed and nobody is inside. The mechanical processing should not impair the safety function.

4

Solution: The radar sensor placed in the processing area reliably detects people even in harsh environments. Usually combined with safety proximity sensors on machine doors and a safety controller, a restart is prevented if the monitoring area is not ‘free’ and the machines are not ‘closed’.

Transportation path safeguarding with high robustness

Requirement: Safeguarding and detection of persons is to be ensured in open areas or environments with reflective surfaces along the transportation routes of transfer wagons, AGVs or cranes.

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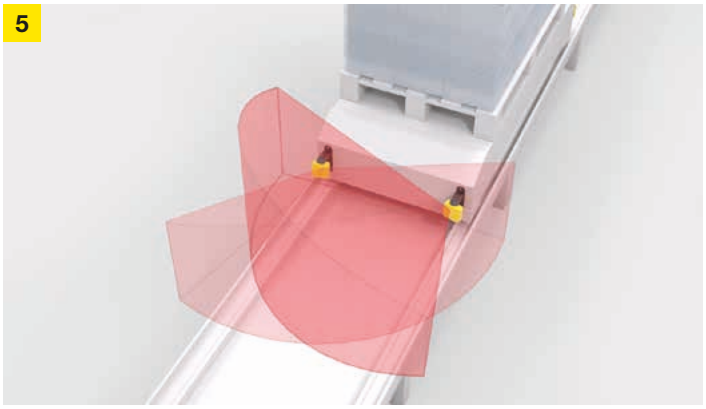
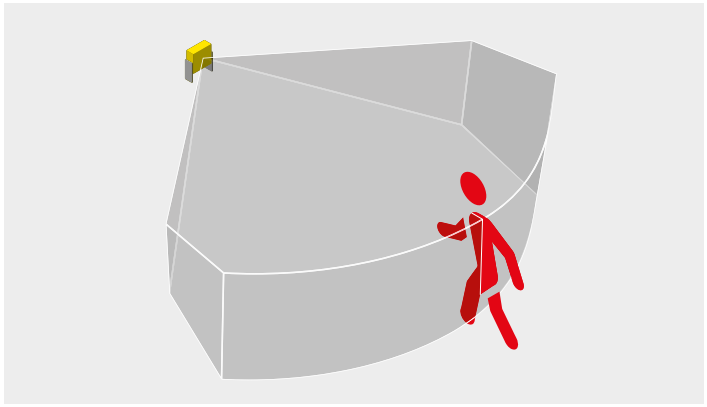


Solution: The LBK radar system’s sensors monitor the transportation route via adjustable lobes with warning and protective fields without any erroneous switching caused by the environment or ambient light, because it only detects people.

Reliable operation under demanding environmental conditions

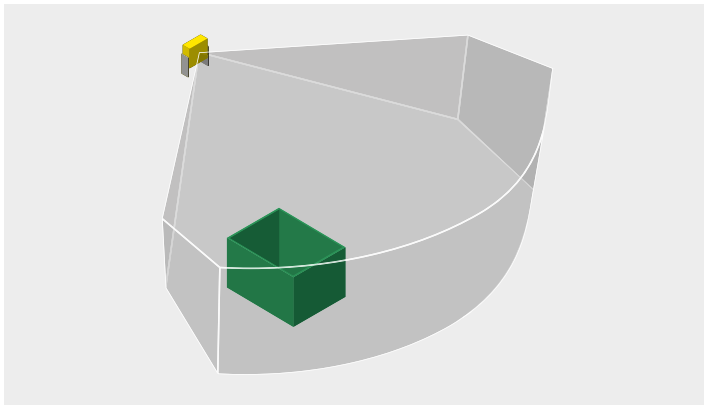
The radar principle is resistant to environmental influences such as dirt, dust, sawdust, smoke, oil, humidity and light. This guarantees reliable operation of the machine even under demanding environmental conditions and avoids unnecessary shutdown.

Function



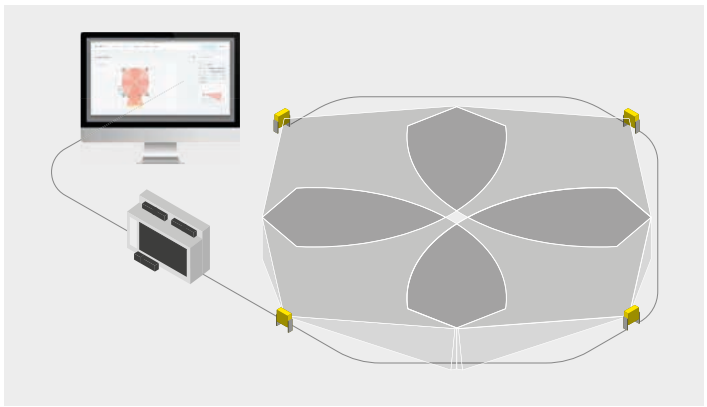
The LBK safety radar sensors detect movements and are used for safeguarding hazardous areas. They monitor the protected area for access by and the presence of persons. Even persons who are standing still are not really ‘static’ and are therefore detected reliably by the sensor.
The 3D radar principle allows areas on steps, pedestals and behind non-metallic shadowing to be monitored as well.

Static objects permitted in protected area



The radar technology reacts sensitively to movements. However, static objects in the monitored area do not cause the safety signal to switch off. Static objects such as pallets, material containers and tool trays are therefore allowed to be placed in the protected area.

Simple and flexible system design



To safeguard larger areas, a controller evaluates up to 6 sensors. With 4 channel configurations per controller, up to 24 sensors can be used in one application.
The system parameters can be simply adapted to the application using the LBK Designer configuration software.
Controllers with PROFIsafe-, FSoE und CIP Safety interfaces are available to enable integration into secure fieldbus systems. Thus, detailed status information relating to the system can also be queried.

Overview of technical data

					
		LBK S-01	**LBK SBV-01**	**LBK SBV-201**	**LBK SBV-205**
Features	Tolerance range	400 … 500 mm	200 … 300 mm	200 mm	200 mm
	Number of detection fields	2	4	4	4
	Detection field area	4 m	5 m	5 m	9 m
	Shape of the detection field	Cone	Cone	Asym. cone / rectangular	Asym. cone / rectangular
	Detection range angle, horizontal	50° / 110°	10° … 100° 10° step size	10° … 100° 5° / 10 mm step size left / right	10° … 100° 5° / 10 mm step size left / right
	Detection range angle, vertical	15° / 30°	20°	20°	20°
	Min. restart time	10 s	4 s	4 s	4 s
	Diagnosis output	Object distance	Object distance, angle	Object distance, angle	Object distance, angle
	Connector	2 M12, 5-pin	2 M12, 5-pin	2 M12, 5-pin	2 M12, 5-pin

						
		LBK ISC-03 LBK ISC110	**LBK ISC-02 LBK ISC110E**	**LBK ISC BUS PS LBK ISC110E-P**	**LBK ISC100E-F LBK ISC110E-F**	**LBK ISC110E-C**
Features	Inputs	2x two-channel 4x one-channel (FW 2.0)	2x two-channel 4x one-channel (FW 2.0)	2x two-channel 4x one-channel (FW 2.0)	2x two-channel 4x one-channel (FW 2.0)	2x two-channel 4x one-channel
	Outputs	2x secure two-channel 4x non-secure one-channel	2x secure two-channel 4x non-secure one-channel	2x secure two-channel 4x non-secure one-channel	2x secure two-channel 4x non-secure one-channel	2x secure two-channel 4x non-secure one-channel
	Configuration interface	USB	USB, Ethernet	USB, Ethernet	USB, Ethernet	USB, Ethernet
	Non-secure fieldbus communication	–	MODBUS TCP	MODBUS TCP	MODBUS TCP	MODBUS TCP
	Secure fieldbus communication	–	–	PROFIsafe	FSoE	CIP Safety
	Switching between configurations via IOs	Max. 4/8 (FW1.6/2.0)	Max. 4/8 (FW1.6/2.0)	Max. 4/8 (FW1.6/2.0)	Max. 4/8 (FW1.6/2.0)	Max. 8 (FW1.6/2.0)
	Switching between configurations via fieldbus	–	–	Max. 32	Max. 32	Max. 32
	MicroSD card slot	ISC110	ISC110E	ISC110E-P	ISC110E-F	ISC110E-C
	Connectable sensor types	All	All	All	All	All

Our portfolio at a glance

Switching sensors
— Optical sensors
— Inductive sensors
— Capacitive sensors
— Ultrasonic sensors
— Fiber optic sensors
— Fork sensors
— Light curtains
— Special sensors

Measuring sensors
— Distance sensors
— Positioning sensors
— 3D sensors
— Light curtains
— Bar code positioning systems
— Fork sensors

Safety
— Safety Solutions
— Safety Laser Scanners
— Safety Light Curtains
— Single and Multiple Light Beam Safety Devices
— Safety Radar Sensors
— Secure Locking Devices, Switches and Proximity Sensors
— Safety Controllers and Relays
— Machine Safety Services

Identification
— Bar Code Identification
— 2D-Code Identification
— RF Identification

Data transmission
— Optical data transmission systems

Network and connection technology
— Connection technology
— Modular connection units

Industrial image processing
— Light section sensors
— Smart camera

Accessories and add-on products
— Signaling devices
— Mounting systems
— Reflectors

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