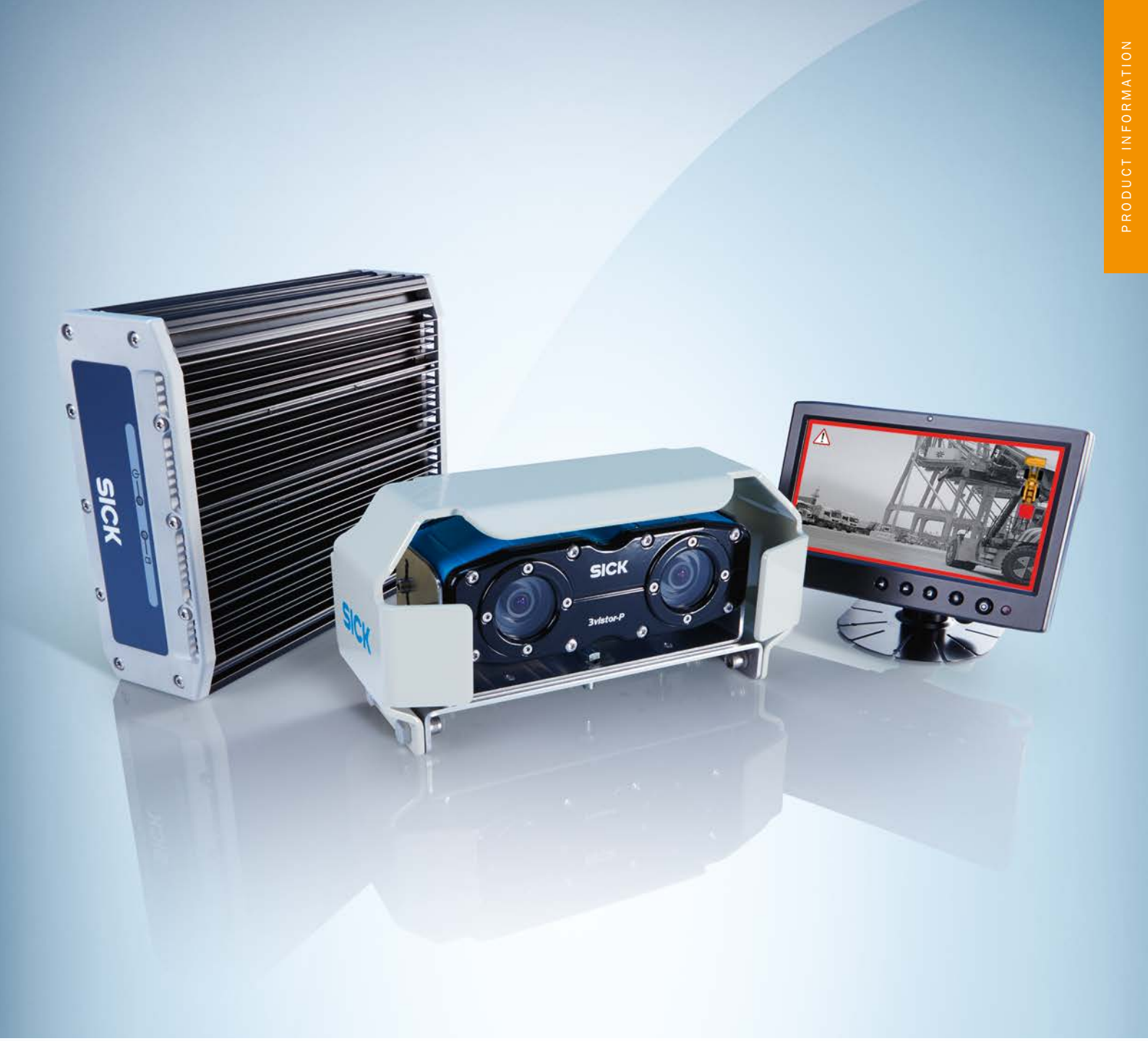
PRODUCT INFORMATION



3vistor-P

3D SNAPSHOT - TWO EYES FOR EFFECTIVE USE OUTDOORS

3D vision

SICK
Sensor Intelligence.

The SICK 3vistor-P is a driver assistance system for industrial vehicles. It is well suited for working in outdoor environments, e.g. in mines, ports and construction sites. The 3vistor-P supports drivers maneuvering large vehicles by continuously monitoring blind spots in three dimensions.

Detecting objects

The 3vistor-P detects relevant objects around the vehicle and displays the live image on a monitor. The 3D snapshot technology is based on evaluating not only the width, but also the height of the objects. Intelligent algorithms developed by SICK, filters out irrelevant information for the driver, such as curbs, small stones, rain or fog. This ensures, that the driver assistance system only warns the driver in really critical situations.

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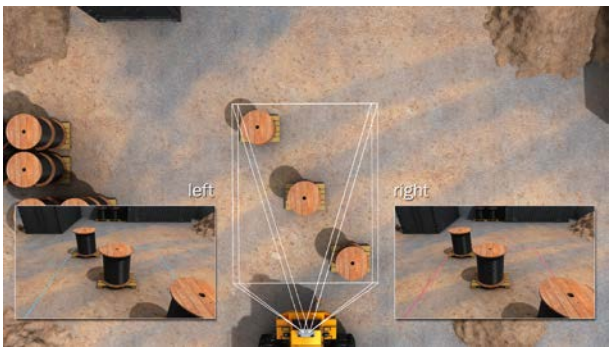
DRIVER ASSISTANCE SYSTEM FOR COLLISION AWARENESS IN HARSH ENVIRONMENTS

Straightforward configuration

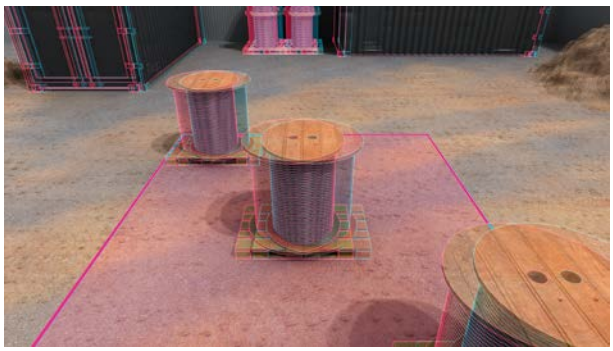
The 3vistor-P is a plug and play solution. Simply select one of the proposed kits that fits your application best. The electrical and mechanical accessories included in the kit make installation considerably easier. Detection zones, sensor parameters, and vehicle parameters can be set directly via the monitor, which is also included. With an operating temperature range of –40 °C to 75 °C and an IP 69K housing, you can be sure the 3vistor-P from SICK is rugged and reliable. Algorithms which have been validated in the field under real conditions ensure that the 3vistor-P CV continues to work reliably in harsh environments.

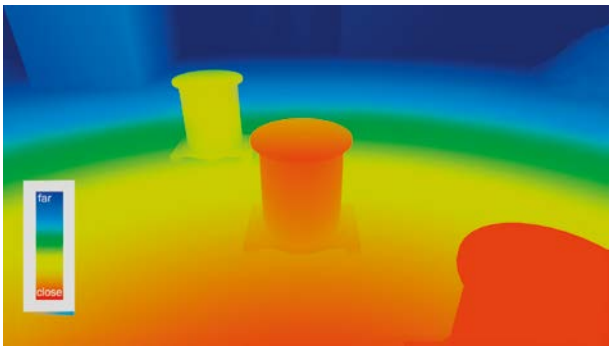
3VISTOR-P CV PRINCIPLE OF OPERATION

The 3vistor-P-is based on the stereoscopic principle. It records objects around the vehicle with two images from slightly different perspectives. The difference between these two images are used to calculate information about the depth, which represents the third dimension. The principle of operation is comparable to human spatial vision: The sensor head captures raw 3D data in much the same way as the eyes, and the evaluation unit is programmed – in a similar way to act as the brain – to analyze the vehicle environment and warn the driver in critical situations. All of this makes the 3vistor-P a highly intelligent driver assistance system for collision awareness.



First step: Take simultanously two images from different positions


Second step: Find correspondences between the images.



Third step: Create depth image.

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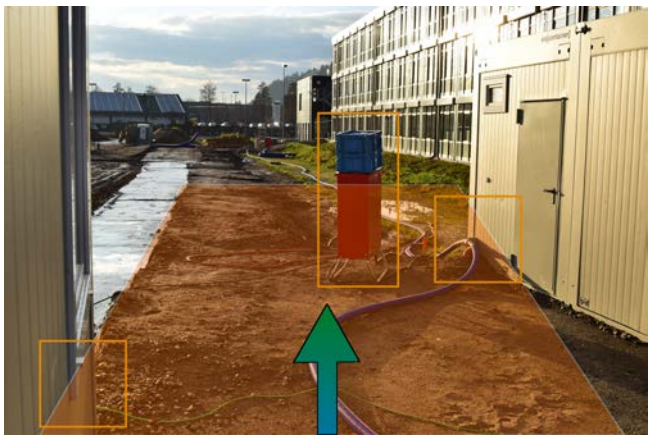
OBJECT CLASSES

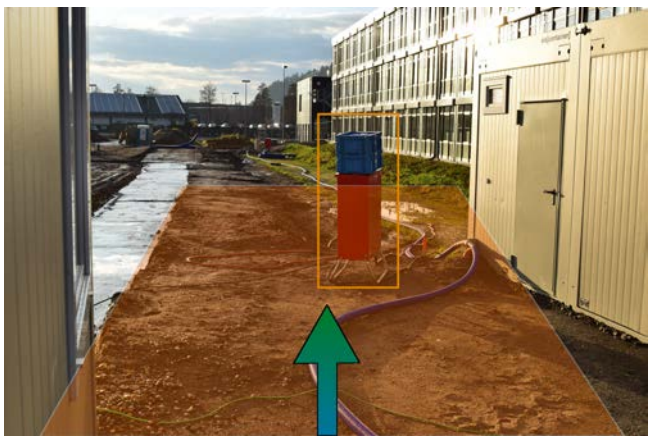
Object class 1



Objects with dimensions as 40 cm x 80 cm and bigger are detected within an object class 1.

Relevant objects within the zone like the walls or the power distribution box triggers the alarm when the zone is configured for this object class. The picture above shows three classified obstacles which are marked with an orange frame. Object class 1 selection fits well if efficient and both high detection rate is desired.

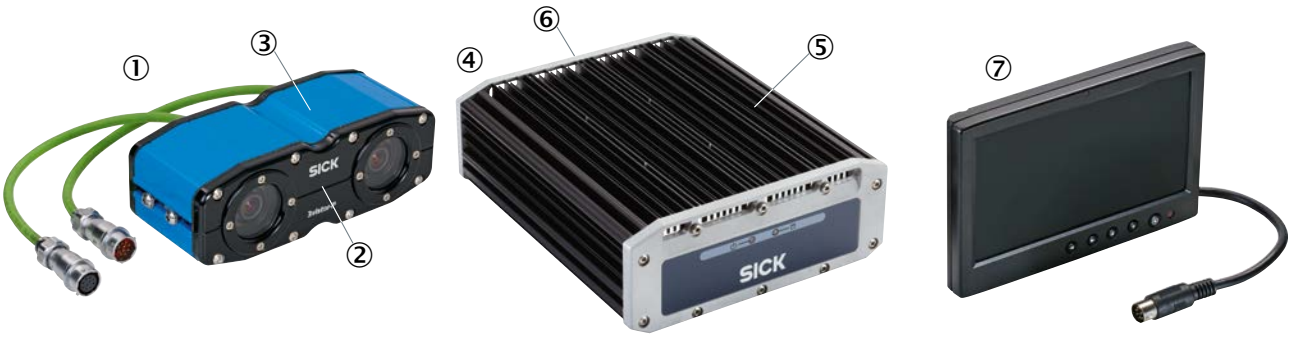
Object class 2



Objects with dimensions round about 40 cm x 160 cm are detected within an object class 2.

In this case, bigger objects like the walls are ignored. In the picture above only the power distribution box triggers the alarm. Object class 2 selection fits well when the machine drives to narrow paths so that only typical movable goods like distribution box or other similar shapes are desired to be detected.

PLUG-AND-PLAY SOLUTION



① Active 3D sensor and 2D camera in one system.

② Sensor head: The detection angle of 105° x 90° perfectly covers blind spots behind the vehicle at a maximum size of 6 m length and a width of 4 m.

③ Sensor head housing: Suitable for use in outdoor environments, as it has an enclosure rating IP 69K, and a temperature range from –40° C to 75° C.

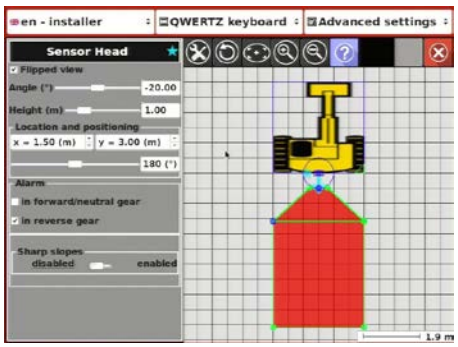
④ Evaluation unit: Compact dimensions, powerful, continuous and reliable evaluation of the data. The video recording the last hours of operation.

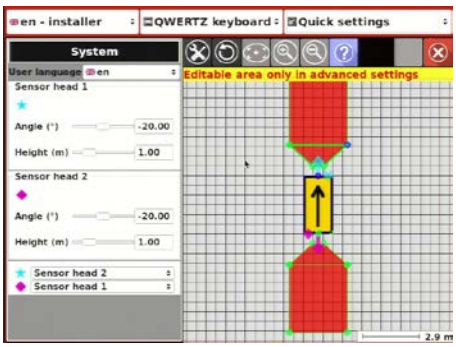
⑤ Evaluation unit housing: Rugged, enclosure rating IP 67, temperature range from – 20° C to +40° C.

⑥ Additional output for audiovisual alarm.

⑦ Monitor for configuring detection zones, sensor parameters, and vehicle parameters, and to display objects in 2D and output of 3D sensing. Visual and audible alarms activated when the previously defined 3D detection zone is breached.

HMI configuration:





EMC compatibility due to mobile machinery standards:	
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005-08
	EN 61000-6-3:2007-01
	EN 12895:2000-10 (industrial trucks)
	EN 13309:2010-09 (construction machinery)
	ISO 13766:2006-05 (earth-moving machinery)
	ISO 14982:2014-12 (agricultural and forestry machines)
	DIN EN 55022:2012-06
	FCC PART 15:2006-08

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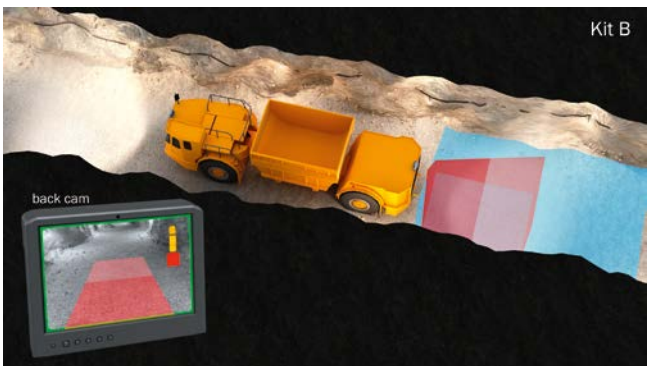
APPLICATIONS

The 3vistor-P can be used on heavy-duty trucks in the following applications:

Ports and cranes

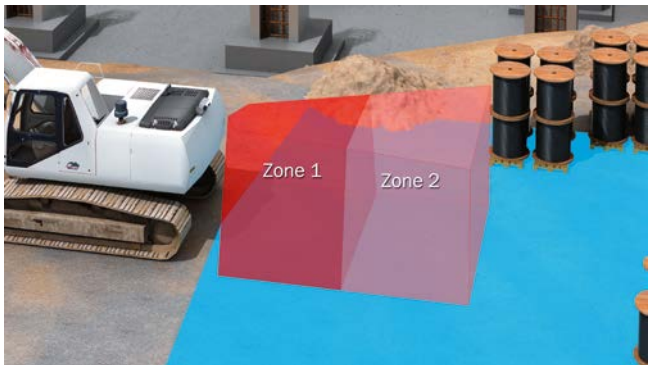
e.g., for the following vehicle types
- Reach stackers
- Heavy capacity fork lifts

Mining



e.g., for the following vehicle types
- Vehicles for tunnels and underground work
- Heavy trucks
- Diggers

Construction sites

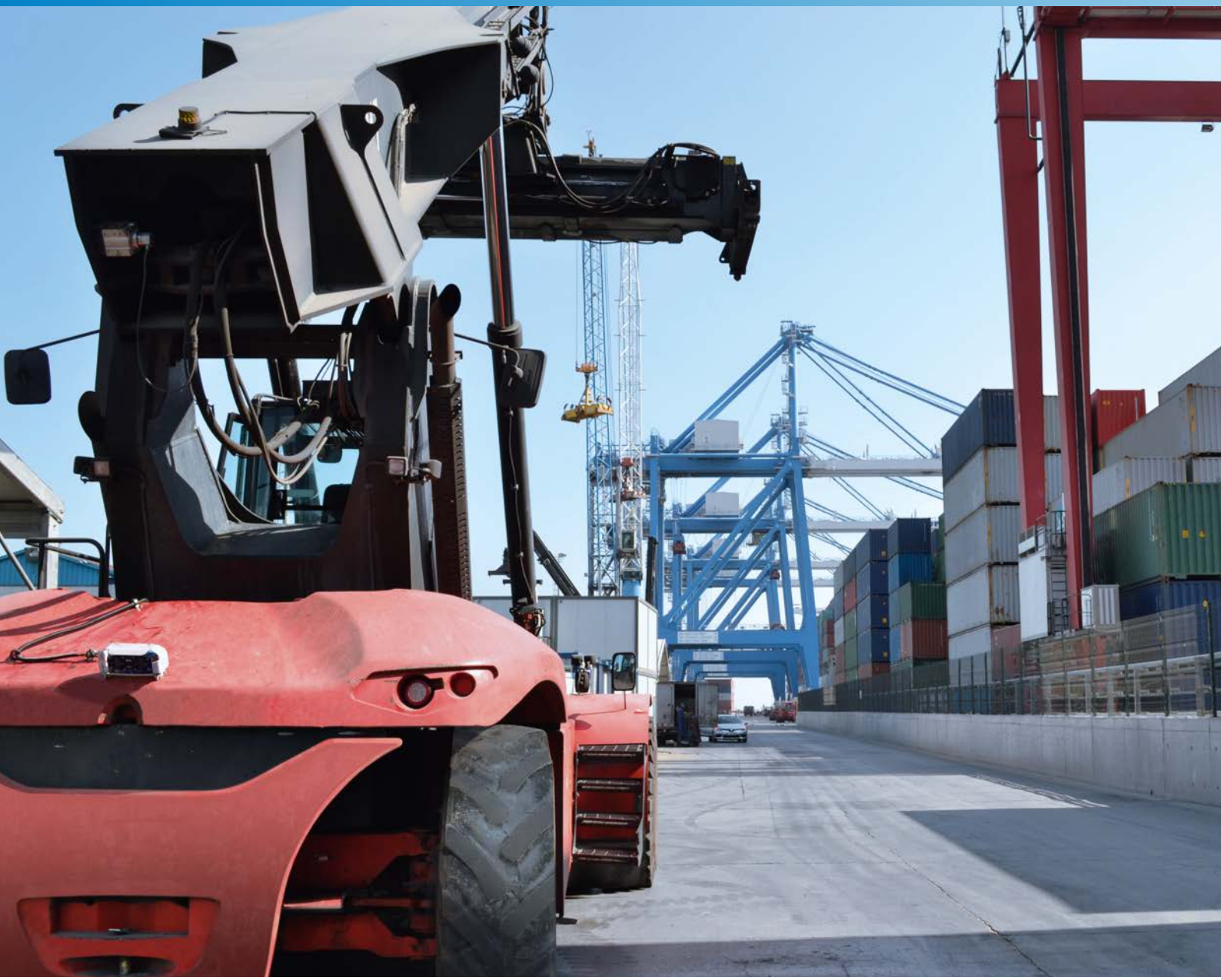


e.g., for the following vehicle types
- Diggers
- Front loaders
- Dumpers
- Rollers

Agriculture and forestry

e.g., for the following vehicle types
- Field choppers
- Wood harvesters

3D-TECHNOLOGY FOR DRIVER ASSISTANCE IN PORTS & CRANES



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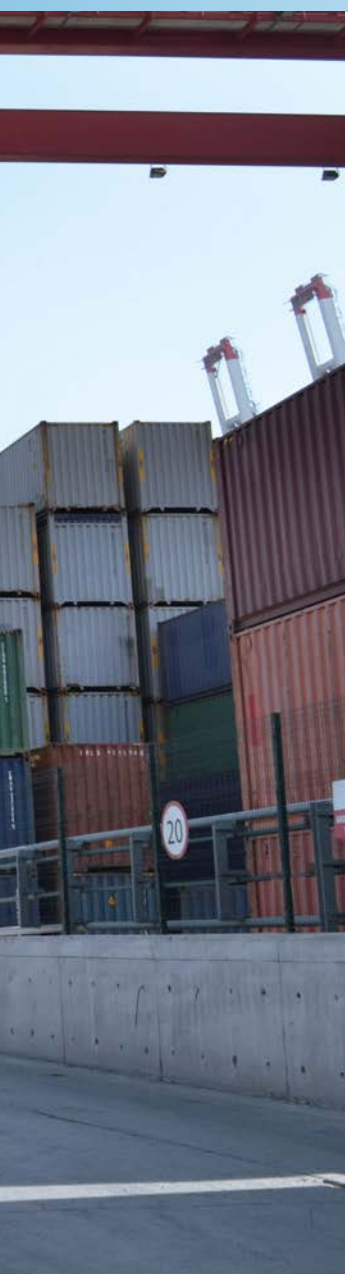

A port without a reach stacker is inconceivable.

A reach stacker operator needs to handle many different tasks. Although this includes driving the reach stacker, that is not the operator‘s most critical task. Instead, the operator needs to be able to focus on rapid container turnover. In addition, maneuvering a forklift or crane is not like driving a car, since it can entail driving backwards not just for brief periods but for hours at a time in some cases. This is precisely where the 3vistor-P CV with 3D technology is here to help. It uses audio and visual signals to warn the driver in critical situations. This means the driver does not need to constantly keep an eye on the monitor as is the case for conventional passive 2D camera systems. The 3vistor-P CV lets the driver focus on the key tasks while still maintaining awareness of critical situations whenever they occur.

The typical reach stacker rear end is 2 m tall and 3 m wide. This size creates blind spots directly behind the vehicle that need to be made visible to the operator. The 3vistor-P CV A kit fulfills this task with utmost efficiency. Variable configurations are available for the detection zones so that the system triggers a warning only in truly critical situations. Matching the vehicle width to the detection zone ensures there are not any superfluous signals, such as when driving through narrow passages.

The 3vistor-P CV is an indispensable aid in cases where a reach stacker operator is looking to concentrate more on key tasks than on just driving.

3D SNAPSHOT – TWO EYES FOR EFFECTIVE USE OUTDOORS

Product description

3vistor-P is perfectly designed for use on heavy duty off-road vehicles working in outdoor environments for example at ports, mines, construction sites and agricultural sectors. The live images appear on the monitor and the operator is notified of any breaches of the 3D detection zone with visual and audible warnings. The system warns the operator only in critical driving situations, e.g. during maneuvering. As 3vistor-P is a plug & play solution, it is easily configurable, ready for operation and proves itself with easy handling.

At a glance

- Intelligent 3D assistant systems improve collision awareness in harsh outdoor environments
- High temperature range from –40 °C to +75 °C
- Rugged housing: IP 69K for the sensor head
- Sensing range up to 6 m
- 2-in-1 solution: Active 3D sensor with integrated 2D live camera
- Installation height between 1 m and 2.4 m
- Standalone system with monitor enables simple configuration
- Records activities from the last hours

Your benefits

- This 3D solution provides a real image with a visual and audible warning enhances collision awareness
- Perfectly designed to work in challenging outdoor environments – even in strong sunlight or rain.
- You get everything in one package, suitable for retrofit business
- Assists operator to concentrate more on his duties, e.g. during maneuvering
- 3D vision helps to detect relevant objects in blind zones around the vehicle
- Recording feature helps for event analysis
- Simple and intuitive configuration

Additional information

→ www.sick.com/3vistor-P

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

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Detailed technical data

Features

Task	3D driver assistance system for collision awareness outdoors
Technology	3D, snapshot, image analysis
Working distance	0.5 m ... 6 m
Detection angle	105° x 90°
Adjustable detection zone (W x L)	4 m x 6 m within specification
Further functions	Recording option integrated, 2D camera integrated

Performance

Detectable object shape	See HMI and operating instruction
On delay	< 50 s
Response time	< 200 ms
Integrated application	3D driver assistance system for collision awareness outdoors

Interfaces

Configuration software	Via provided monitor

Mechanics/electronics

Connections	1 x USB 2 x sensor head, male/female Monitor (VGA/sound) Additional alarm output; two discrete outputs Machine-to-machine interface (Kit C) External power supply (reserved, not implemented) Evaluation unit supply
Supply voltage	12 V DC, ± 30 % 24 V DC, ± 30 %
Power consumption	≤ 40 W Kit A ≤ 50 W Kit B ≤ 80 W Kit C (depending on type)
Enclosure rating	IP 69K sensor head IP 67 evaluation unit
Weight	1.3 kg [1] 5 kg [2]
Mounting	Height 1 m ... 2.4 m, angle according to the detection zone (must be delimited by the ground)

[1] Sensor head.

[2] Evaluation unit.

Ambient data

Electromagnetic compatibility (EMC)	EN 61000-6-2:2005-08, EN 61000-6-3:2007-01, EN 12895:2000-10 (industrial trucks), EN 13309:2010-09 (construction machinery), ISO 13766:2006-05 (earth-moving machinery), ISO 14982:2014-12 (agricultural and forestry machines), DIN EN 55022:2012-06, FCC PART 15:2006-08
Shock load	In accordance with EN 60068-2-27 1994-01 (sensor head)
Vibration load	In accordance with ISO 16750-3 (sensor head and evaluation unit)
Ambient operating temperature	–40 °C ... +75 °C, sensor head –20 °C ... +75 °C, evaluation unit
Light sensitivity	200 lx ... 80,000 lx

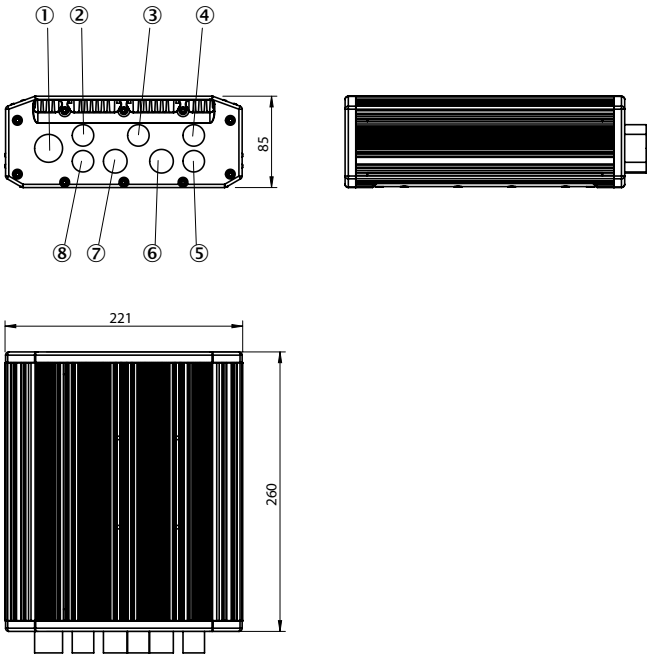
Ordering information

- **Further functions:** recording option integrated, 2D camera integrated
- **Enclosure rating:** IP 69K sensor head
  IP 67 evaluation unit

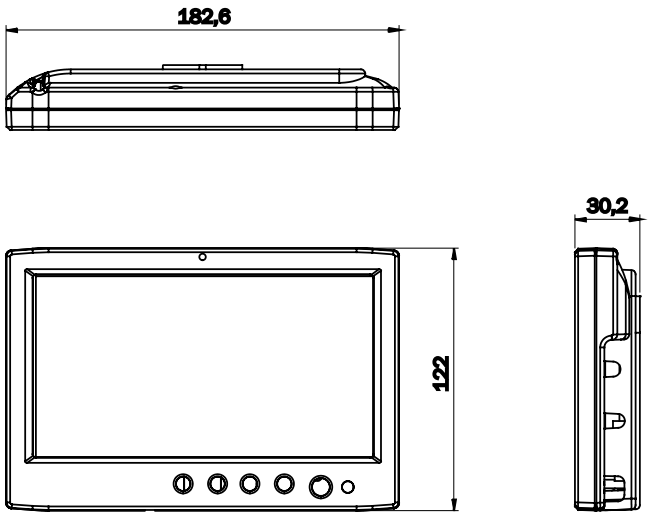
Description	Power consumption	Type	Part number
1 x sensor head 1 x Evaluation Unit 1 x 7" monitor Assembly accessories	≤ 40 W Kit A	V3S153- 1AAAAAAP01	1072939
2 x sensor head 1 x Evaluation Unit 1 x 7" monitor Assembly accessories	≤ 50 W Kit B	V3S153- 1AAAAAAP02	1074001
2 x sensor head 2 x Evaluation Unit 2 x 7" monitor Assembly accessories	≤ 80 W Kit C	V3S153- 1AAAAAAP03	1074002

Dimensional drawings (Dimensions in mm (inch))

Evaluation unit



Monitor



① M20, USB
② M14, 6-pin power supply EU,12/24 V
③ M14, 9-pin machine interface (Kit C)
④ M14, 2-pin external power supply (reserved, not implemented)
⑤ M14, 4-pin, additional alarm output
⑥ Bayonet, 10-pin sensor head, female
⑦ Bayonet, 10-pin sensor head, male
⑧ M14, 9-pin VGA/sound

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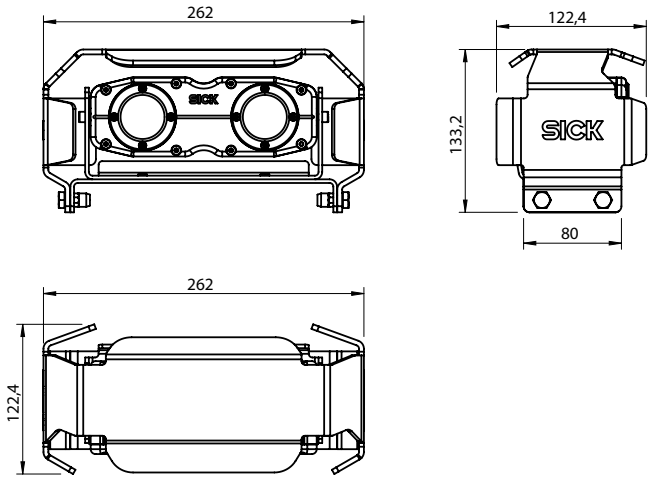
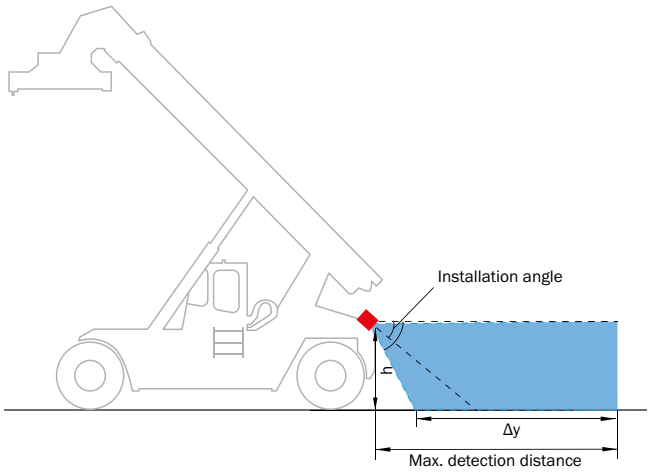
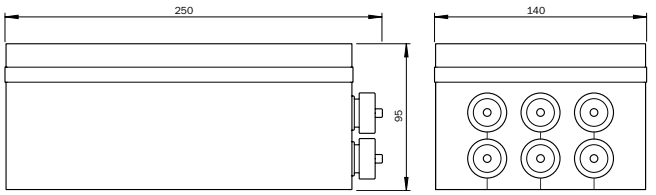
Sensor head



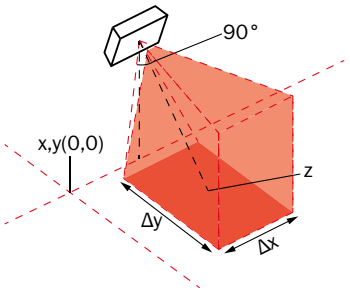


Mounting height (m)	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
Mounting angle (°)	0	-6	-11	-17	-23	-29	-31	-33

Switchbox

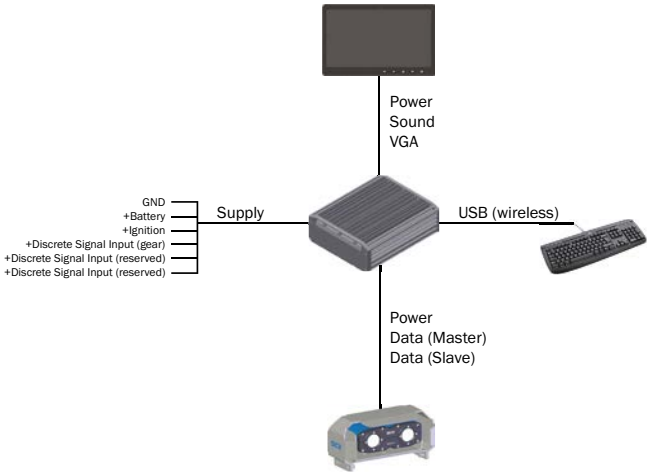


Field of view



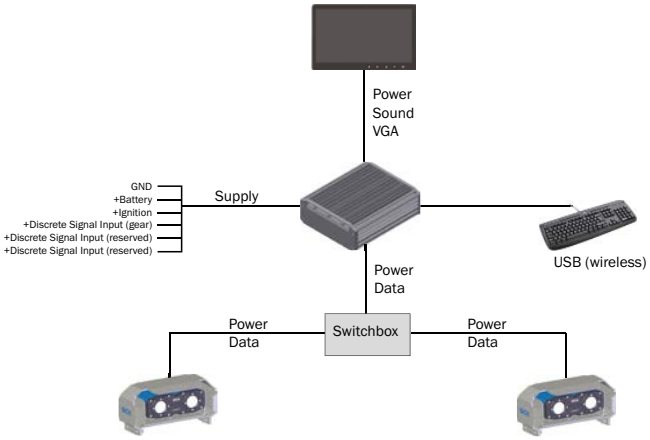
Connection diagram

Kit A



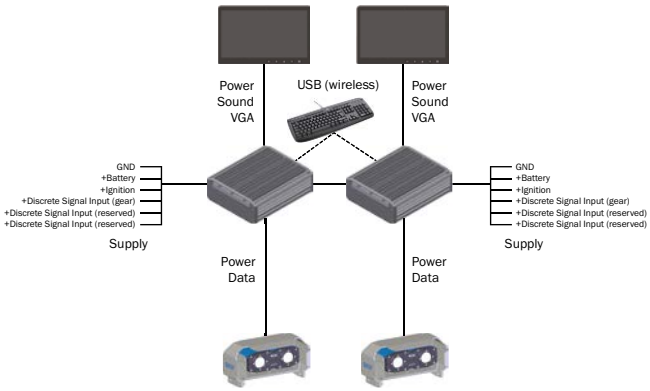
Keyboard and cable sets are not included in any kit

Kit B



Two sensors operate by-turns. Keyboard and cable sets are not included in any kit.

Kit C



For extended field of view. Keyboard and cable sets are not included in any kit.

Accessories

Connection systems

Plug connectors and cables

	Cable	Cable length	Type	Part no.
	Cable set for connecting the sensor head and evaluation unit (2 x 10 m), for kit B and C two cable sets are required!	10 m	Bayonet, 10-pin (10 m)	2078941
	Cable set for connecting the sensor head and evaluation unit (2 x 20 m), for kit B and C two cable sets are required!	20 m	Bayonet, 10-pin (20 m)	2078943
	Alarm cable for two discrete outputs, 0/12 V	5 m	M14, 4-pin screw plug with open end	2086211

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Reflectors and optics

Optics cloths

	Brief description	Type	Part no.
	Cloth for cleaning the front screen	Lens cloth	4003353

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 7,400 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and additional representatives → www.sick.com

SICK
Sensor Intelligence.