PRODUCT INFORMATION

Lector® series

PIONEERING READING TECHNOLOGY

Image-based code readers

SICK
Sensor Intelligence.

Fixed mount bar code scanners

Laser-based fixed mount bar code scanners have an outstanding depth of field and can therefore identify bar codes on objects of varying heights. Due to the large aperture angle of up to 60°, most conveyor belt widths can be covered by only one device.

RFID

RFID is particularly well suited to harsh ambient conditions, for example extreme temperatures or identification objects under high physical stresses. In contrast, optical technologies require visual contact at all times in order to detect the code and are therefore more susceptible to wear or contamination.

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➜ www.sick.com/more-than-a-vision

SEE MORE TOGETHER

**Intelligent questions have more than one answer.
The best technology depends on the task at hand.**

In reality, providing an effective solution for identification tasks requires more than just one technology. SICK gives you that choice. Three technologies, one philosophy:
Your customer requirements come first.

For every identification task, the same question comes up: Which technology is best? And as is so often the case in life, there is never just one answer to this question. The best possible solution is always tailored to the individual technical and economic conditions of the application.

Three identification technologies have dominated the market for many years: Image-based code readers, RFID and fixed mount bar code scanners. As the market leader in automatic identification, SICK not only offers all the main technologies, but also poses the right questions to ensure the right products for you are selected from its technology portfolio.

Image-based code readers

Image-based code readers are characterized by their flexibility in the selection of the code type. In addition to reading 1D bar codes, they employ a range of image processing algorithms to identify 2D codes, such as the frequently used Data Matrix, QR, or MaxiCodes, as well as plain text. They make light work of switching from bar codes to 2D codes.

- Flexible code reading (1D, 2D and OCR)
- Live image and image storage for analysis or data archiving
- Omnidirectional reading with just one device
- Reading, evaluation and analysis even when codes are damaged
- Reliable reading of codes with widely varying module widths
- No moving parts

THE 7 CHALLENGES IN FACTORY AUTOMATION

In industrial production, a large number of workpieces, intermediate and end products are provided with codes so that they can be clearly identified. This allows transparent tracking of the individual components. Whether high speed, reflections from foils, or multiple codes per scan: Image-based code readers from SICK reliably detect 1D and 2D codes, even under demanding conditions.

1. DIFFICULT TO RECOGNIZE DIRECTLY-MARKED CODES
2. REFLECTIONS AND MIRRORING
3. DIFFERENT CODE AND BACKGROUND COLORS
4. HIGH CYCLE RATES IN PRODUCTION PROCESSES
5. TIME- AND COST-EFFICIENT MOUNTING AND SETUP
6. SYNCHRONOUS RECOGNITION OF A WIDE RANGE OF CODES
7. DIFFICULT WORKING CONDITIONS DUE TO DAZZLING CAMERA LIGHTING

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1

Challenge

DIFFICULT TO RECOGNIZE DIRECTLY-MARKED CODES

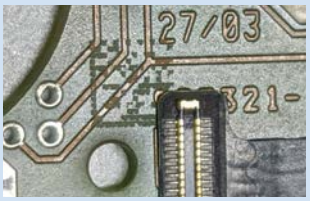
Weak contrast

Rough textured surface

Oil film over code

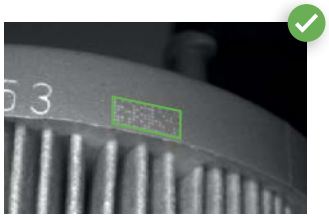
Micro code < 1 mm

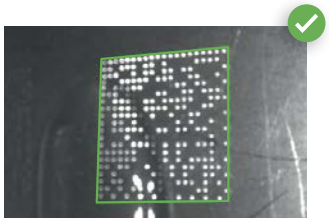
Defective code

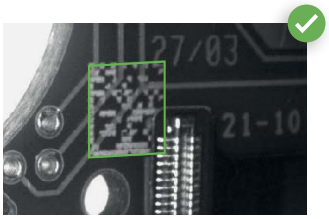


Solution

PROGRESSIVE DPM DECODER FOR SIMPLY ANY CODE







Industrial components often have codes applied directly to the surface. This allows permanent and unique identification. The surface condition of the component and the size and quality of the code play a role here: Rough, dirty, low-contrast and reflective surfaces as well as very small or defective codes are a challenge. Thanks to the progressive DPM decoder, even difficult-to-read codes and micro codes with a size of less than 1 mm can be reliably identified.

CHALLENGES IN FACTORY AUTOMATION

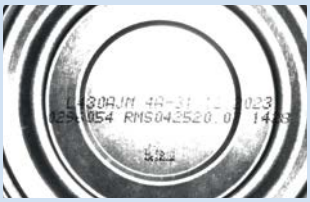
2

Challenge

REFLECTIONS AND MIRRORING

Reflection

Mirroring



Solution

SMART OPTICS ACCESSORIES – ALWAYS PERFECTLY ILLUMINATED

Polarizing filter

Dome

The basis for reliable code reading is a well-illuminated image and a perfectly visible code, preferably without disturbing reflections and mirroring. The Lector® series offers two complementary solutions for this purpose. Reflections can be effectively eliminated via a polarizing filter. Alternatively, the screw-on dome provides uniform illumination. This prevents shadows and hard edges caused by direct illumination. External dome illumination, which means additional installation effort and costs, is eliminated. We can find out together which variant is the best solution for your application.

Polarization filter switchable via software after mounting

Dome for diffuse 180° illumination

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3

Challenge

DIFFERENT CODE AND BACKGROUND COLORS

Black on red

White on yellow

Black on blue

Solution

MULTI-COLOR LIGHTING – IN THE RIGHT LIGHT AT ALL TIMES

The lower the contrast between the code and the background, the harder it is to read clearly. Two different LED colors are used to detect such difficult-to-read codes, which, depending on the circuit, significantly increase the image contrast and thus the detection quality on colored backgrounds. For this purpose, two images – one image per light color – are created and evaluated or both colors are activated simultaneously. The result: High-contrast images for clear identification, regardless of the color scheme of the codes and backgrounds.

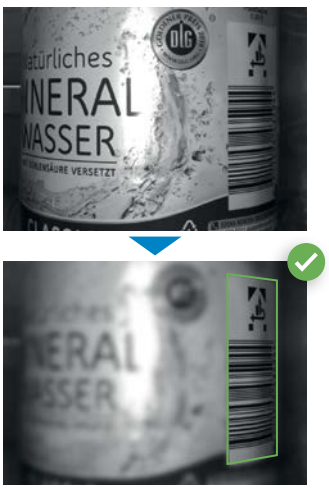
4

Challenge

HIGH CYCLE RATES IN PRODUCTION PROCESSES

Solution

BACKGROUND SUPPRESSION – FOR UP TO 40 CODES PER SECOND



For more efficiency, the speed of processes and conveyor belts keeps increasing.
The Lector® series cameras read codes at a cycle rate of 40 Hz. This is made possible by the “background suppression” function: Irrelevant information such as logos, texts and graphic areas are hidden and not processed. This shortens the computing time, increases the decoding speed and allows for higher cycle rates in industrial processes.

CHALLENGES IN FACTORY AUTOMATION

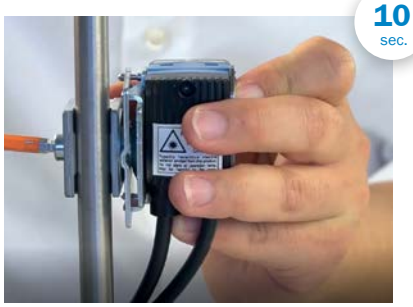
5

Challenge

TIME- AND COST-EFFICIENT MOUNTING AND SETUP

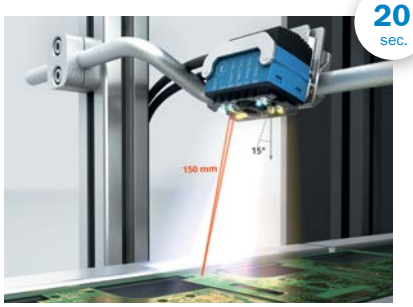
Solution

1, 2, 3, GO – COMMISSIONING IN 50 SECONDS



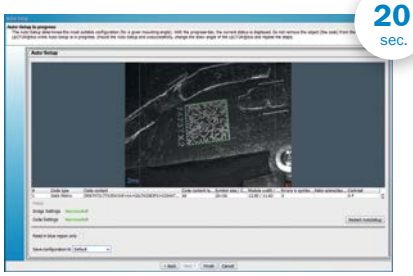
1. Mounting with snap-in bracket

Integration of the image-based code readers from SICK is extremely convenient. The sensor is simply clicked onto the snap-in bracket. The bracket can be attached to the installation site using a clamp, moved into any position and fixed with a screw.



2. Alignment with I4.0 sensors

To minimize reflections, the code reader is usually mounted at an angle of 15 – 20° to the conveyor belt. The integrated inclination sensor quickly and precisely detects the mounting angle, reports it back and ensures that all devices are mounted at the correct angle.



3. Parameterization with smart assistants

The reading distance can be adjusted in seconds using the distance data from the TOF sensor (TOF = time-of-flight). The optimal setting for brightness and for the decoder is adjusted completely and automatically with just one click using the Auto setup function.

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Challenge

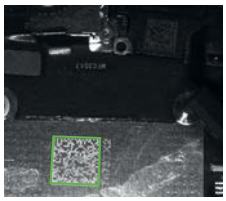
SYNCHRONOUS RECOGNITION OF A WIDE RANGE OF CODES

Code 1: Weak contrast, dark surface

Code 1: Bright, highly reflective surface

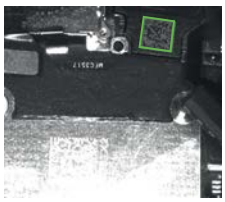
Solution

APS – AUTOMATIC PARAMETER SWITCHING FOR MAXIMUM FLEXIBILITY



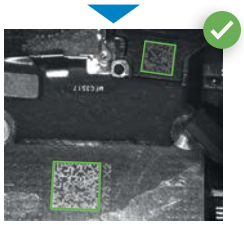
Code 1 is read

+



Code 2 is read

=



Both codes are recorded

Automatic parameter switching (APS) allows for parallel detection of a wide variety of codes in the sensor field of view. The image recognition parameters are automatically switched through so that the recognition quality is optimal and the code reader can reliably process all codes in the field of view.

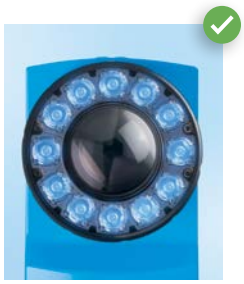
7

Challenge

DIFFICULT WORKING CONDITIONS DUE TO DAZZLING CAMERA LIGHTING

Solution

INVISIBLE IR LIGHT – FOR UNDISTURBED WORK



Code reader illumination must not disturb or blind workers. The Lector® series therefore offers a variant with infrared light. The wavelength of the LEDs is in the non-visible spectrum and still ensures reliable detection. Surrounding workstations are not affected by code capture. This allows undisturbed work in close proximity to image-based code readers.

THE 4 CHALLENGES IN LOGISTICS AUTOMATION

The demands on speed are increasing dramatically with growing online trade and increased parcel volumes. Conveyor belts are becoming faster and faster, and the flow of parcels on the conveyor belts is becoming denser. This sets new standards in terms of the speed at which parcels and logistics containers are to be automatically identified for sorting and picking processes. The performance of the identification systems here depends on how well processes can be made flexible and the identification systems scaled. To overcome this challenge, SICK offers custom-fit and high-performance solutions with the Lector® series.

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Challenge

HARD TO READ PRINTED CODES

Distorted

Covered

Faded

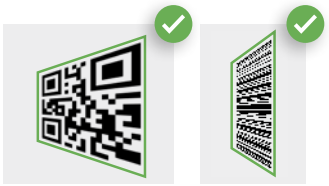
Glossy

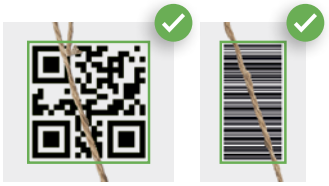
Polluted

Low contrast

Solution

INTELLIGENT LOGISTICS DECODER – FOR PARTICULARLY CHALLENGING CODES





Codes can lose quality due to transport and handling. Readability suffers if, for example, codes are dirty, washed out, covered by reflective film, partially obscured by other objects such as parcel string, or printed with low contrast. Perspective distortions caused by positioning on the conveyor belt or by mounting the reader at a steep angle also make clear recognition difficult. The powerful logistics decoder of the Lector® series identifies even difficult-to-read codes quickly and reliably.

CHALLENGES IN LOGISTICS AUTOMATION

9

Challenge

FAST CONVEYOR BELT SPEEDS IN LOGISTICS PROCESSES

Solution

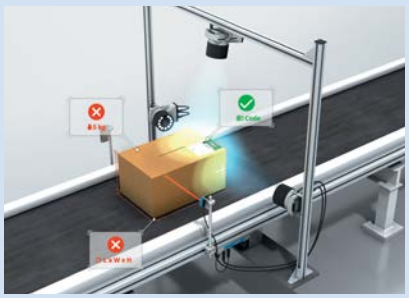
KEY REGION DETECTION – FOR MAXIMUM THROUGHPUT

Thanks to the specially developed algorithm for the “Key Region Detection” function, the image-based code readers can focus exclusively on decoding the relevant image areas (in real time). This enables particularly fast internal data processing and higher throughput rates for logistics applications.

10

Challenge

COMPLEX APPLICATIONS THAT REQUIRE MORE THAN JUST CODE READING



Conventional code reading interval

Solution

TURNKEY SYSTEM SOLUTIONS – EVERYTHING FROM A SINGLE SOURCE

Turnkey track and trace system

SICK develops individual system solutions for complex measuring tasks. Modular in design, these provide comprehensive logistics data, from dimensioning/weighing for certified billing to bar code identification and optical character recognition (OCR) of the address field if the code is completely destroyed. For particularly wide conveyor belts, the Lector® series offers the option of “image stitching” for combining images from multiple cameras into one image and archiving them for further analysis. In the process, SICK experts provide assistance for the projects, from the request through to planning and design and finally commissioning.

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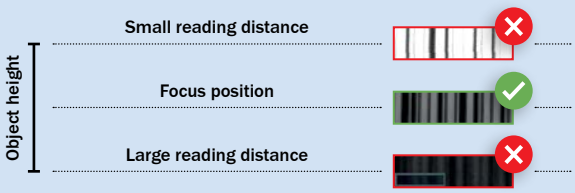
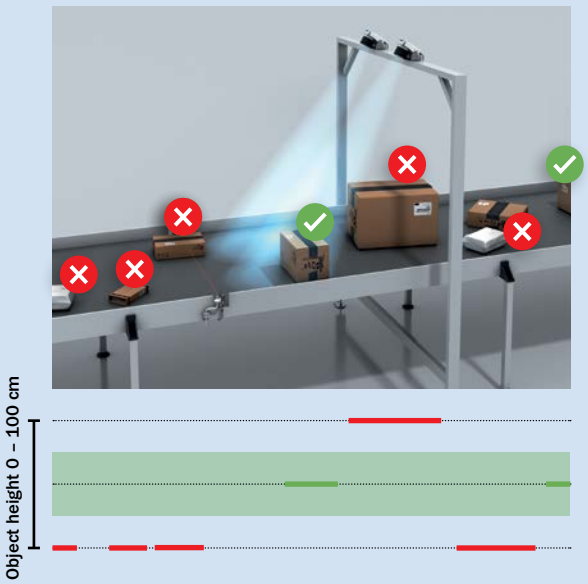
Challenge

VARYING OBJECT HEIGHTS IN RUNNING PROCESSES

Conventional code reader with fixed focus

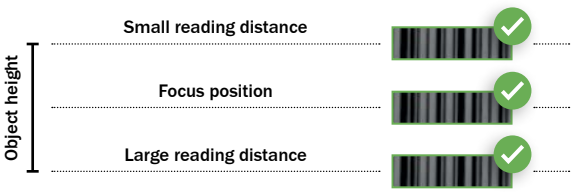


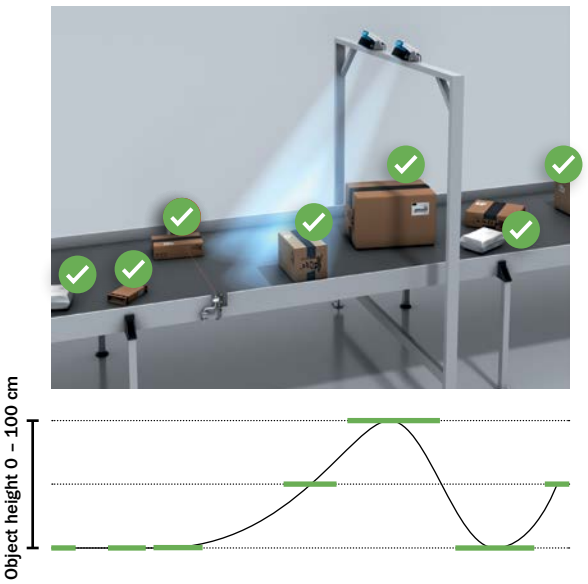


Solution

DYNAMIC FOCUSING – EVERY OBJECT IN FOCUS

Image-based code readers from SICK with dynamic focus





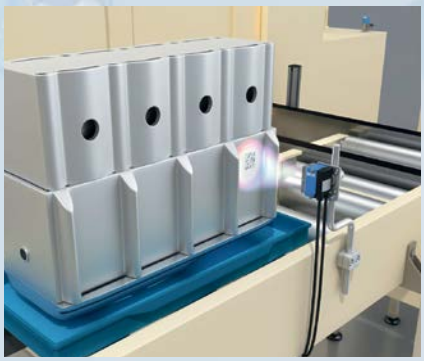
Flat, medium-sized, tall parcels – in logistical applications, the dimensions of the objects to be identified usually vary, and so does the reading distance to the code. Dynamic focusing optimally adjusts the focus position of the camera lens to the respective reading height. This always results in a sharp and perfectly illuminated image. Codes at different heights are thus reliably read and quickly processed, regardless of the camera distance.

AT HOME IN MANY INDUSTRIES

Image-based solutions for code identification are indispensable in many industries. In industrial and logistical environments, the Lector® series from SICK ensures high speed, efficient processes, and permanently reliable code detection.

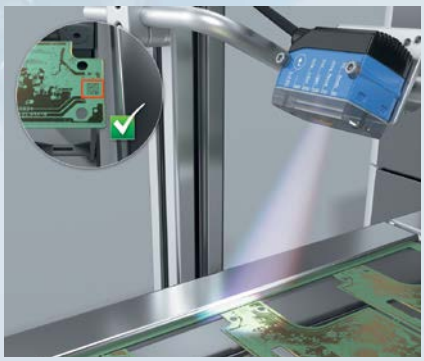
CONSUMER GOODS INDUSTRY

The Lector® series enables fast and error-free code capture and ensures high cycle rates in the pharmaceutical, food and beverage industries.



AUTOMOTIVE INDUSTRY

Particularly powerful algorithms solve demanding applications in motor production when reading needle embossed DPM codes.



ELECTRONICS AND SOLAR INDUSTRY

Whether Data Matrix codes on printed circuit boards and electronic components or directly-marked 2D codes on solar wafers – even the smallest codes for parts tracking and quality assurance are reliably detected.

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COURIER, EXPRESS, PARCEL AND POSTAL INDUSTRY

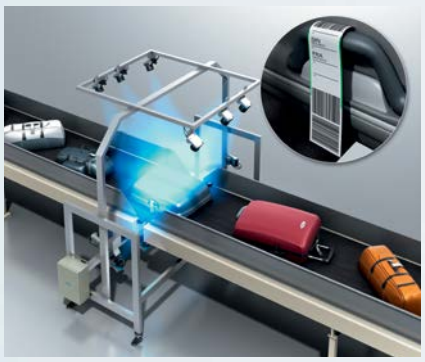
Identification of parcels and flats while belts are moving. Whether from above, from one or from all six sides, Lector tunnels always ensure maximum performance.

RETAIL AND WAREHOUSING

Image-based code readers and reading tunnels offer an efficient solution for fast material handling in semi-automated manual workstations or automated sorting systems.

STORAGE AND CONVEYOR TECHNOLOGY

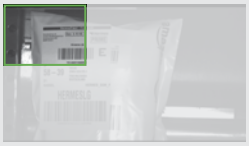
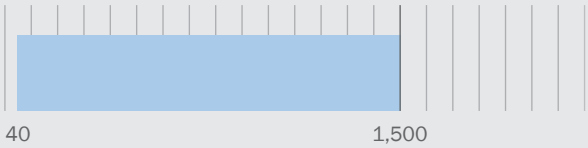
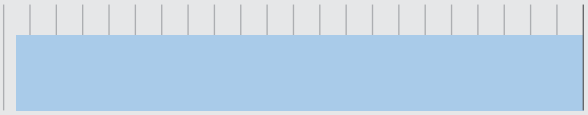
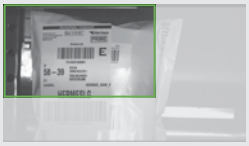
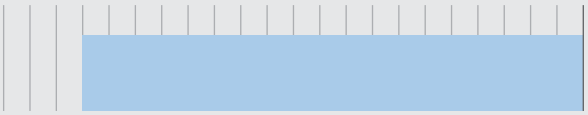
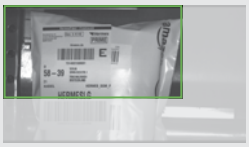
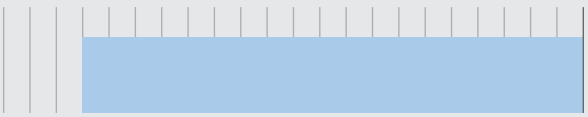
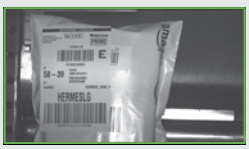
Whether simple side reading of codes on containers or complex object identification on wide conveyor belts, code readers from SICK can be individually scaled to any application.



AIRPORT

The high turnover rate at airports requires smooth processes and data flows. Part of the solution: Particularly reliable code readers with high decoding performance.

THE Lector® series AT A GLANCE

Lector® series	Reading distance (mm)	Field of view for code with 0.3 mm cell size	Smallest readable code resolution (mm)
Lector61x 			0.04  0.02
Lector62x 			0.1  0.05 
Lector63x 			0.1  0.1 
Lector64x 			0.1  0.1 
Lector65x 			0.1  0.1 

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	Challenge	Feature	Lector61x	Lector62x	Lector63x	Lector64x / 65x
		Dimensions L x W x H (mm)	50 x 40.3 x 29.6	71 x 43 x 35.6	108 x 63.1 x 74.1	142.8 x 90 x 106.1
		Sensor resolution (px)	640 x 480 1,280 x 960	752 x 480 1,280 x 1,024	1,280 x 1,024 1,600 x 1,200	1,600 x 1,088 / 2,048 x 1,088 2,048 x 2,048
		Enclosure rating	IP54	IP65/67	IP67	IP65
		microSD memory card	–	✔	✔	✔
1	DIFFICULT TO RECOGNIZE DIRECTLY-MARKED CODES	Progressive DPM decoder	✔	✔	✔	✔
2	REFLECTIONS AND MIRRORING	Matching optics accessories	Polarizing filter	Polarizing filter Dome illumination	Polarizing filter	Polarizing filter
3	DIFFERENT CODE AND BACKGROUND COLORS	Multi-color illumination				
4	HIGH CYCLE RATES IN PRODUCTION PROCESSES	Background suppression	✔	✔	✔	✔
5	TIME- AND COST-EFFICIENT MOUNTING AND SETUP	Auto focus	–	✔	–	✔
5	TIME- AND COST-EFFICIENT MOUNTING AND SETUP	Intelligent sensor technology	TOF sensor Inclination sensor	Inclination sensor	–	–
5	TIME- AND COST-EFFICIENT MOUNTING AND SETUP	Auto setup	✔	✔	✔	✔
6	SYNCHRONOUS RECOGNITION OF A WIDE RANGE OF CODES	Automatic parameter switching	✔	✔	✔	✔
7	DAZZLING CAMERA LIGHTING	IR light	–	✔	✔	–
8	HARD TO READ PRINTED CODES	Intelligent logistics decoder	✔	✔	✔	✔
9	FAST CONVEYOR BELT SPEEDS IN LOGISTICS PROCESSES	Key Region Detection	✔	✔	✔	✔
11	VARYING OBJECT HEIGHTS IN RUNNING PROCESSES	Dynamic focus	–	–	–	✔
	DETAILED INFORMATION		**www.sick.com/ Lector61x**	**www.sick.com/ Lector62x**	**www.sick.com/ Lector63x**	**www.sick.com/ Lector65x**

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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 10,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

That is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, 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 further locations → www.sick.com

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