

IN-VITRO DIAGNOSTICS

SENSOR SOLUTIONS FOR CLINICAL AND LABORATORY AUTOMATION

YOUR ADVANTAGE: THREE TECHNOLOGIES FOR ANY APPLICATION



RFID

- Reliable identification of concealed or contaminated objects, as no visual contact with the RFID tag is necessary
- Identification of large objects with undefined tag position due to large reading distances and reading field widths
- Reads and writes data
- High level of counterfeit protection and data protection due to encrypted data transmission



1D



2D



Image-based code readers

- Flexible reading of various code types, regardless of the code alignment (360°)
- Monitoring of code qualities to optimize processes by using code analytics in the device
- Subsequent image analysis as images of identified objects are stored
- Reading, evaluation, and analysis of severely damaged codes due to corrective image processing algorithms



1D

Laser-based bar code scanners

- Code identification at various distances and with different object sizes due to a large depth of field with just one device
- A single device also provides coverage of wide reading areas due to a large aperture angle
- High read stability even in varying ambient light due to outstanding ambient light immunity
- Low commissioning costs as auto-focus function means setup couldn't be simpler

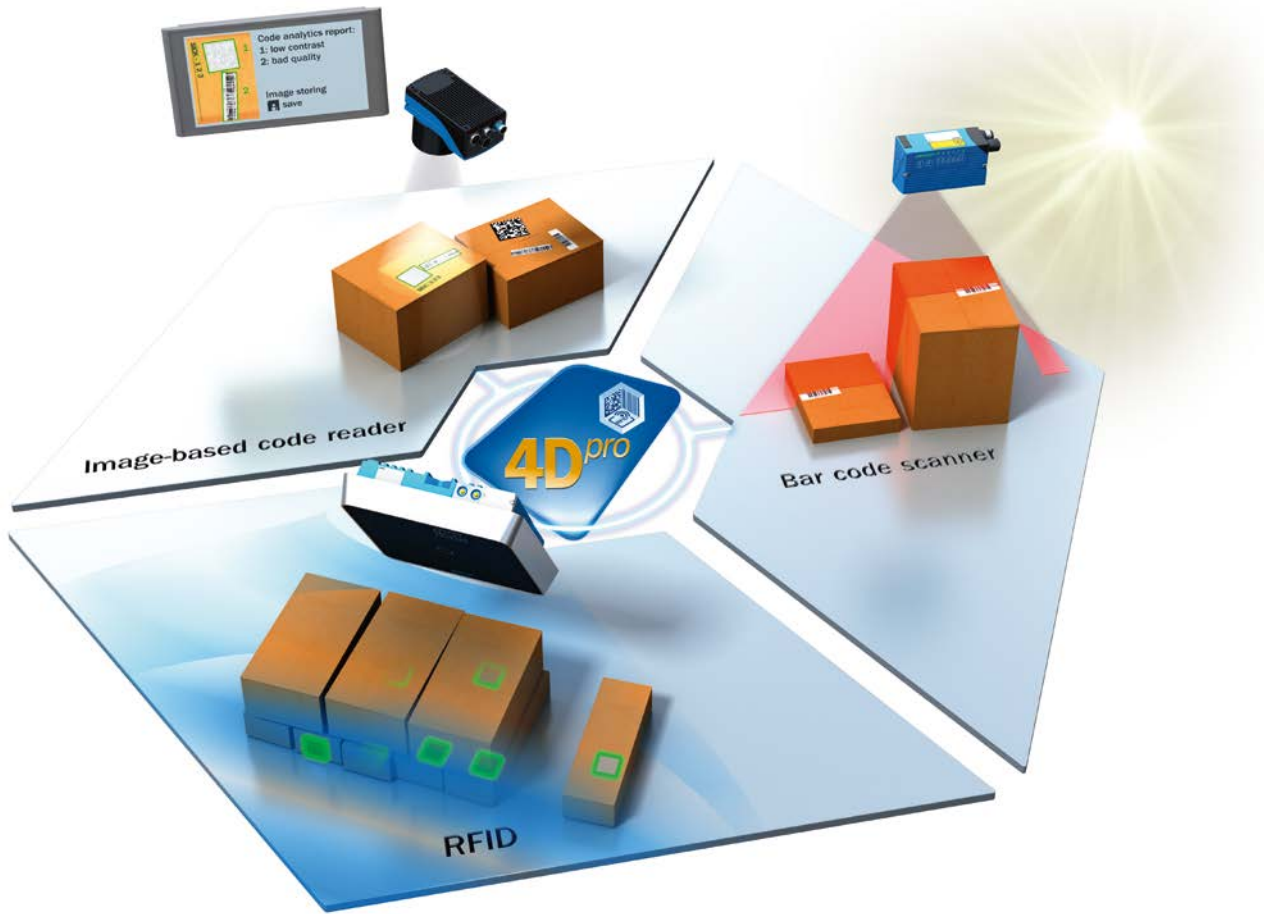
SERVICES, SYSTEMS, AND TAILORED SOLUTIONS

Three visions – one guarantee

Based on over 70 years of practical experience, SICK offers standardized services for a fixed price, such as regular performance checks to prevent unwanted downtime. Professional commissioning and maintenance of devices ensures optimum performance. With an extended warranty, customers can even secure their investment for up to five years. Customer-specific services such as pre-configuration, upgrades, engineering, and training complete the service portfolio.

Three visions – one system

Thanks to their modular architecture, sensor systems from SICK can be expanded flexibly and adapted to your requirements. Whether laser, camera, or RFID: All three technologies can be brought together in one system solution if required. In such cases, the customer interface is completely independent of the technology used. This means that various reading tasks and optical identification procedures can be completed with one system. These include top reading with image-based code readers, side reading with a laser scanner and sensors from the Lector® series, or the ability to detect totes and perform optical identification at the same time with the aid of RFID.



Tailored sensor functions with SICK AppSpace

Finding an identification solution that's tailored to your requirements – sounds time-consuming and difficult, or even impossible, doesn't it? Not if you decide on the SICK AppSpace eco-system, which can even be combined with your application as an option. Here, application developers define the solution themselves: Intelligent software tools, high-performance programmable devices, and a dynamic developer community create a solid foundation for designing customized sensor solutions. This enables completely new and adaptive solutions for automation applications.

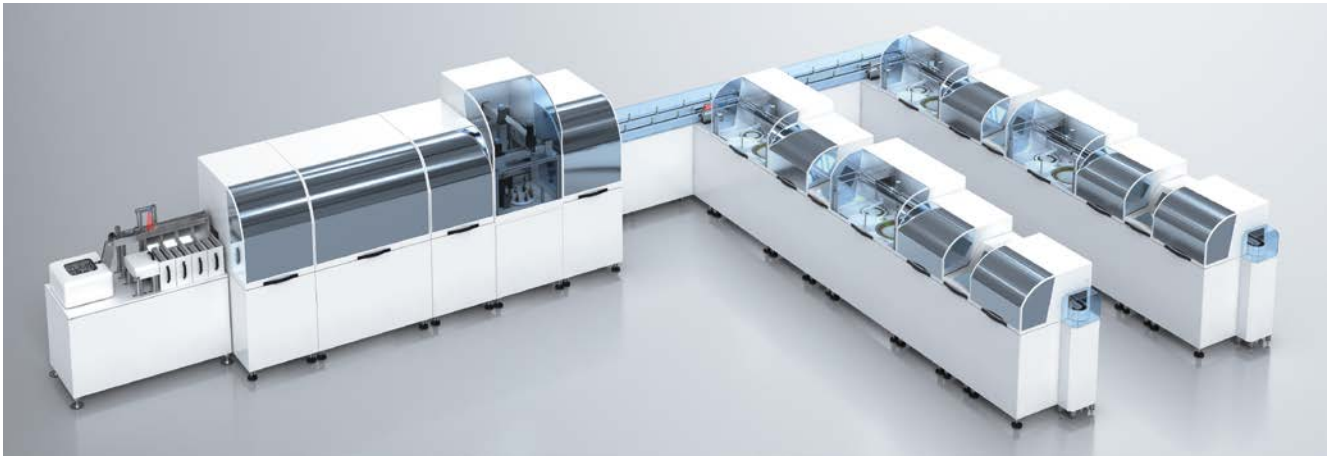
→ www.sick.com/SICK_AppSpace

4Dpro – one concept for all technologies

To provide you with the flexibility you need, SICK has developed a concept enabling you to interchange and network our identification sensors across all the different technologies. Whichever solution you choose, you can be sure of a flexible future with the 4Dpro platform from SICK:

- Standardized connectivity and cloning function for flexible device replacement
- Low level of training required thanks to standardized configuration software and user interface
- Standardized accessories concept for a compact choice of components

CHALLENGES FOR IN-VITRO DIAGNOSTICS



Automation solutions have considerably improved many analytical laboratory processes. Identification devices make automated registration of large sample quantities of different sizes possible and ensure reliable assignment of analysis results to the corresponding identification numbers of patients. As sensors precisely detect test tubes and caps, processing steps in in-vitro diagnostics can be automated. Reliable components for challenging applications are the key to efficient clinical analysis equipment. These help to meet the growing demands of health care worldwide.

→ [sick.com/health_care_manufacturing](https://www.sick.com/health_care_manufacturing)



Identification of samples

When supplying samples to the machine via a manual single feeder, tray feeder or unsorted bulk feeder, test tubes of different sizes must be registered. Reliable code reading, even if the code quality or code alignment is poor, is therefore mandatory for safe processing of samples and for reliable analysis results. Correct assignment of the results to the correct sample identification number must always be ensured.

Identification of consumables and reagents

Consumables and reagents are identified by codes when they are inserted into the machine. This ensures the use of the correct material or reagent and allows for verification of expiration dates and batch identification numbers. In addition, identification provides data on when the operator needs to refill consumables and reagents into the machine. This supports machine operator's decisions and reduces errors.

Detection of test tubes and caps

In diagnostic processes, analyzers handle caps as well as test tubes with different heights and diameters. Sensors for presence detection provide precise position information, e. g. to robot grippers, or detect empty and occupied positions in trays. In addition, presence detection is an important verification step for decapping and recapping modules.

PRE-ANALYTICAL PHASE

Detection and identification of 1D and 2D codes and cap detection



Detection and identification of 1D codes on test tubes

To ensure test tubes are correctly sorted, a sorting machine must quickly and reliably recognize and identify the 1D code on a test tube. In this process, the W4F photoelectric sensor continuously informs the CLV50x fixed mount bar code scanner when the next test tube is to be assigned to the correct patient. The combination of CLV50x and W4F ensures stable reading results, even with poor quality or slightly damaged codes. This allows for test tubes to be reliably assigned to the correct patient.

- Fixed mount bar code scanners CLV50x
- Photoelectric sensors W4F



→ sick.com/CLV50x

→ sick.com/W4F



Cap detection and test tube identification in the decapper and sample carousel

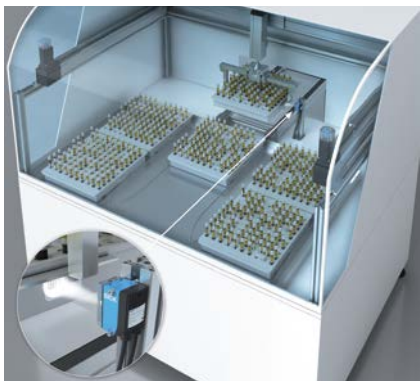
For decapping, two steps are essential to avoid system failures or errors in the process: Reliable cap detection and correct identification of the test tubes. This enables their correct assignment in subsequent process steps. The performance and size of the G6 photoelectric proximity sensor and the CLV60x fixed mount bar code scanner are perfect for the requirements of this application.

- Photoelectric sensors G6
- Fixed mount bar code scanners CLV60x



→ sick.com/G6

→ sick.com/CLV60x



Detection and identification of 2D codes on test tubes

To ensure test tubes are correctly sorted, a sorting machine must quickly and reliably recognize and identify the 2D code on a test tube. In this process, the W4F photoelectric sensor continuously informs the Lector61x image-based code reader when the next test tube is to be assigned to the correct patient. The combination of Lector61x and W4F ensures stable reading results, even with poor quality or slightly damaged codes. This allows for test tubes to be reliably assigned to the correct patient. Due to the increasing amount of data required for this process, the 2D code is becoming more and more important in the detection and identification of test tubes.

- Image-based code readers Lector61x
- Photoelectric sensors W4F

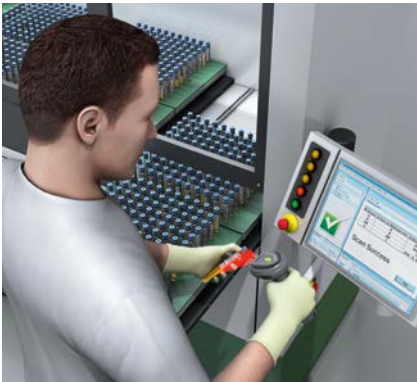


→ sick.com/Lector61x

→ sick.com/W4F

ANALYTICAL PHASE

Manual registration, identification of racks and level measurement



Manual registration of test tubes

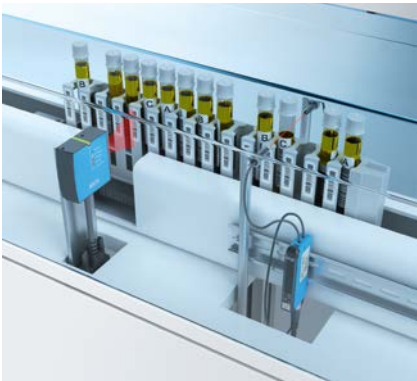
In automated laboratory operation, test tubes are registered automatically or manually when they are supplied to the system. Throughout the entire analytical process, this makes it possible to trace each individual sample by its bar code. The test tubes are registered manually with an IDM24x or IDM14x mobile hand-held scanner.

- Mobile hand-held scanners IDM14x and IDM24x



→ sick.com/IDM14x

→ sick.com/IDM24x



Identification of rack codes and level measurement of test tubes in the Single Lane Analyzer

The reliable CLV60x fixed mount bar code scanner ensures the correct verification of codes on test tubes and racks. This enables sample traceability throughout the entire laboratory process. The rugged housing as well as the compact size of the CLV60x meet the requirements for use in small machines. In this process, LL3 fibers detect the level of liquid in the test tubes.

- Fixed mount bar code scanners CLV60x
- Fibers LL3



→ sick.com/CLV60x

→ sick.com/LL3



Identification of test tubes and rack codes in the Multi Lane Analyzer

For the transport of test tubes, immunoassay analyzers have several transport paths of different lengths and sizes. In addition, the samples must be correctly identified, even at high line speeds. The CLV64x fixed mount bar code scanner easily masters these requirements: Thanks to its excellent dynamic focus reading, it decodes codes on test tubes and racks quickly and reliably. With a reading field of up to 840 mm, the CLV64x meets the high depth of field requirements of this application and enables simultaneous code reading on up to 40 transport lanes. Due to its small size, the G2F miniature photoelectric sensor is the optimal solution for triggering and presence detection in this application.

- Fixed mount bar code scanners CLV64x
- Photoelectric sensors G2F

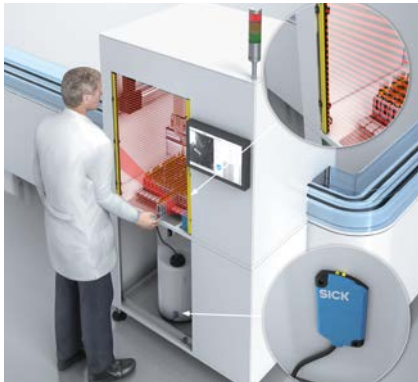


→ sick.com/CLV64x

→ sick.com/G2F

ANALYTICAL PHASE & TRANSPORT

Traceability between the transport modules



Hazardous point protection and leak monitoring

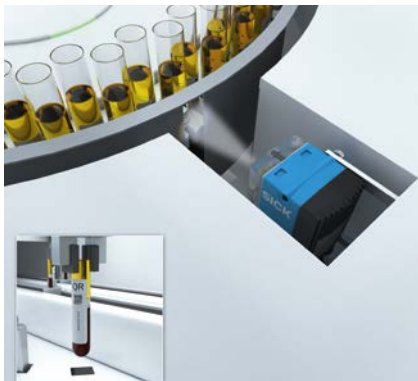
In automated laboratory operation, fully-automated in-vitro diagnostic machines must be protected. The miniTwin4 safety light curtain is well suited for this type of hazardous point protection due to its miniature design and fast response time. Leaks must also be detected at an early stage. This is made possible by the CQ capacitive proximity sensor using non-contact level measurement.

- Safety light curtains miniTwin
- Capacitive proximity sensors CQ



→ [sick.com/miniTwin](https://www.sick.com/miniTwin)

→ [sick.com/CQ](https://www.sick.com/CQ)



Identification of 1D and 2D codes in sample carousel

1D and 2D codes must also be identified in the sample carousel. This is difficult due to the limited available space. However, the Lector61x image-based code reader with its small design and flexible cable routing enables reliable code identification, even in very tight spaces. The integrated special optics with magnification effect can read the smallest codes with up to 0.02 mm (1D code) and 0.04 mm cell size (2D code).

- Image-based code readers Lector61x



→ [sick.com/Lector61x](https://www.sick.com/Lector61x)



Traceability of test tubes during transport

Identification of test tubes along the entire transport route is also important during the analysis phase. This ensures that the correct test tube is used for the next analysis step. The CLV62x fixed mount bar code scanner provides fast and reliable reading results of the test tubes for a smooth analysis process. Thanks to its compact design and variety of interfaces, the CLV62x is easy to integrate into any section of the transport route.

- Fixed mount bar code scanners CLV62x



→ [sick.com/CLV62x](https://www.sick.com/CLV62x)

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