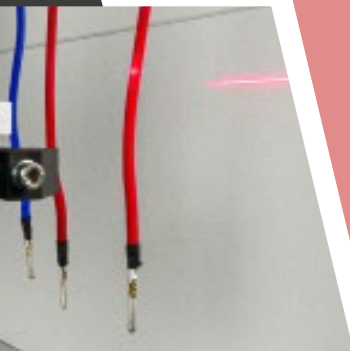




THE WORLD OF LASER PROFILE SENSORS: AN INNOVATIVE TECHNOLOGY FOR PRECISE 3D DATA ACQUISITION

AT A GLANCE: HOW DO LASER SCANNERS WORK?

Laser profile sensors, also known as laser scanners, use the triangulation reflection principle to perform precise measurements of objects and surfaces. Unlike conventional point lasers, they do not just detect a single point, but measure an entire line. By scanning the surface point by point, they achieve high measurement accuracy. The data is captured point by point, enabling detailed 3D contours.



AREAS OF APPLICATION:

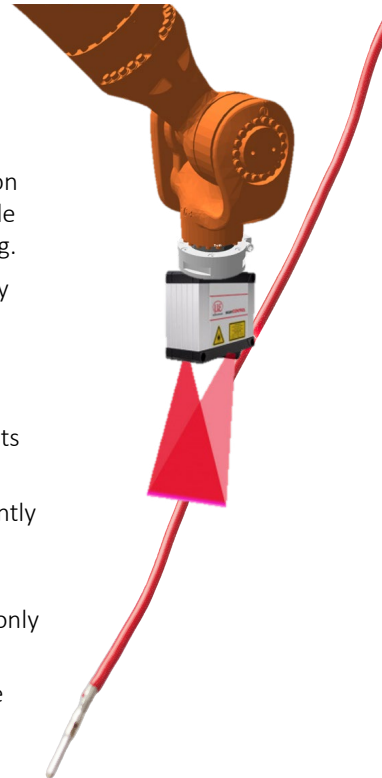
VERSATILE APPLICATIONS OF LASER SCANNERS

Laser scanners are used in a wide variety of applications, such as measuring profiles, width, height, depth, edges and angles up to object detection, while enabling tolerance compensation. From quality assurance in production to precise position measurement of electronic components on printed circuit boards, laser profile sensors offer a wide range of possible applications in the manufacturing industry.

ADVANTAGES AND ALTERNATIVES:

WHY CHOOSE LASER SCANNERS?

- Laser scanners offer fast, accurate and cost-effective data collection.
- They use laser profilometry for precise depth determination and can, for example, be combined with cameras to handle cables in order to correctly align the cable tip after gripping.
- Laser scanners are easy to parameterise and can be flexibly attached to the robot.
- Lasers are insensitive to light conditions and enable, for example, an automated calibration procedure.
- In contrast to 2D cameras, lasers in combination with robots can capture 3D data for the creation of 3D models.
- The evaluation of data collected by 3D cameras is significantly more complex and requires further image processing programs.
- The programming of 3D cameras is very complex and can only be done by very experienced programmers.
- Laser scanners are a cost-effective alternative and save the user a lot of time.

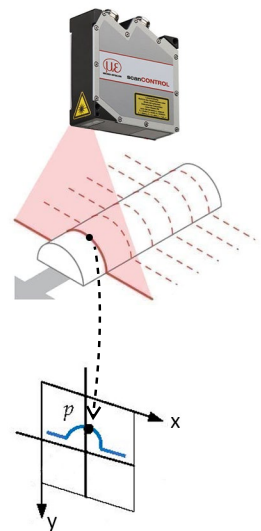


THINGS THAT NEED TO BE CONSIDERED: CHALLENGES AND SOLUTIONS

When integrating laser profile sensors into your overall setting, some factors should be considered. Laser solutions have so far only offered simple problem solutions for geometric objects. By combining ArtiMinds RPS with specialized software, complex shapes can also be detected to enable further applications.

Nevertheless, certain challenges may arise when using laser scanners. For example, overlapping objects may make the detection difficult, or complex shapes may require special algorithms or adjustments.

The use of high-precision measurement technology and intelligent algorithms creates new methods for the detection and manipulation of objects. The calculation of such positions and orientations is usually very complex, but by abstracting them into function blocks or templates, ArtiMinds provides the user with a quick and simple solution.





EFFICIENT INTEGRATION OF LASER SCANNERS THANKS TO ARTIMINDS RPS

The Robot Programming Suite (RPS) supports the use of laser profile sensors by integrating predefined templates. This facilitates the configuration and programming of robots with laser profile sensors and enables efficient and precise data acquisition.

ArtiMinds RPS supports various manufacturers and thus enables problem-free connection of different laser scanners. Currently, we have integrated scanners from Micro-Epsilon, Keyence and LMI Technologies into our software and successfully implemented the first projects.

In the next step, the integration of further manufacturers is planned.

One application example is the automatic scanning of cables. With the ArtiMinds template library, the gripping point and the orientation of the gripper relative to the cable can be carried out quickly and reliably on the basis of a scan of the cable end, allowing a wide range of feeding techniques to be implemented.

Overall, laser profile sensors in combination with robotics open up new possibilities in factory automation and offer a reliable and cost-effective solution for precise 3D data acquisition. Whether it is quality control, object recognition or the measurement of components, laser profile sensors are a powerful technology in robotics. Thanks to simplified programming, ArtiMinds RPS supports you in covering a wide range of application areas and optimizing manufacturing processes.

