

SICK 3D Vision Systems

Production facilities rely on vision inspection systems to evaluate the quality of their products both during fabrication and after assembly. Some applications can benefit from 2D vision systems to identify defects. However, not all features can be accurately detected using 2D vision. For more complex parts and assemblies, a 3D vision system can be far more cost effective and provide more accurate inspection results. SICK has developed a line of 3D vision systems that can be used for high speed inspection in nearly any environment.

3D imaging is created by laser triangulation: a 3D image is created as the part or the assembly passes under a laser beam. 3D measurement provides information about object height, shape and volume, independent of contrast and color. 3D images can be combined with traditional imaging, resulting in a comprehensive inspection of each part or assembly

SICK 3D Camera Models

SICK offers three model lines of 3D cameras: the Ranger, the Ruler, and the IVC-3D smart camera:

Ranger - Ranger 3D cameras are available in 3 black and white imaging models and 1 RGB imaging model. Most Ranger cameras can measure object features such as intensity, gloss, and scatter. Multiple Ranger 3D cameras can be linked together to provide true 3D imaging and measurements.

Ruler - The Ruler line of 3D cameras are designed to be used in rugged industrial environments. The camera includes a built-in laser and optics for a pre-defined field of view. Application development is made in a high-level VB .Net or C++ programming environment.

IVC-3D - The IVC-3D camera is the first smart camera system to incorporate 3D imaging and analysis into a single unit that does not require a computer after initial configuration. The IVC-3D uses patented CMOS sensor technology and an integrated image processor to make 3D image acquisition fast and accurate. The IVC-3D's OPC server and EtherNet/IP interface enables simple communication with PLCs, robots and control systems.

All of the SICK 3D imaging products are easily configured and calibrated to compensate for factors such as lens distortion, perspective view, and the triangulation angle between the camera and the laser. The Coordinator tool from SICK allows users to quickly calibrate their system and provide 3D coordinates in millimeters to the application within minutes.

Applications for SICK 3D Imaging Applications

Measuring the 3rd dimension provides knowledge about object height, shape, or volume



and can quickly identify parts that do not meet specifications. The SICK 3D cameras are ideal for the following applications:

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| Surface defect detecton | Volume calculation |
| Thickness and height Measurements | Robot guidance |
| 3D part location for pick and place | Tire inspection |
| Volume measurement of solder paste | Rail inspection |
| Quality of substrates and components | Board optimization |
| True shape of logs in sawmill | Pallet quality grading |
| Food portioning | Bulk volume measurement |
| Glue string measurement | Optimized meat portioning |

PC applications can be created quickly using the 3D camera development software that includes ready tools for 3D data visualization and camera configuration.