

SD Series High Resolution 3D Sensors For Shape Inspection

General Description - The ShapeDrive® SD Series are compact area scan sensors that reliably provide three dimensional shape data at a very high speed for the cost comparable to a traditional machine vision system. No additional external components like lasers or projectors are required. The sensor is especially designed for true height measurements in high



speed industrial inspection production lines, e.g. electronic manufacturing and automotive inline control environments. In contrast to laser line scanners the object under test does not need to be moved. The sensor can provide a depth resolution of better than 10microns and a lateral resolution of 25microns. The sensor can be connected to a host computer through a Gigabit Ethernet interface which is fully GigEV compliant. The SD Series can operate in camera mode, in 3D mode and in a mixed mode to allow vision engineers to solve for a wide variety of machine vision

tasks. The sensor optionally comes with a built-in laser line which allows acquiring additional 3D information in challenging environments. All sensors (except the -V options) are pre-calibrated and ready to go. Typical applications include high speed inspection of PCB, solder paste printing, casting, plastic molding parts, electronic parts dimensional control, welding points and joints tests, casting parts, medical and biometric applications, food processing, flatness verification.

Key Specifications

3D Operation mode

- Measurement volume*
- Depth resolution typically better than 10microns*
- Lateral resolution 25microns*
- Working distances 100, 200, 300mm or variable
- Up to 1million valid 3D points per second
- Built-in 5mW vertical laser line for additional measurement flexibility (Option)

* see table below

Camera (2D) operation mode

- Built in high definition B/W image sensor with 2048x1125 pixel, up to 90MHz pixel clock, color version upon request
- 12bits pixel depth
- Dynamic range: 60dB
- High dynamic mode: >120dB
- Fully GigEV compliant
- Built in RGB LED (3Watts each) for color vision (Option)
- 32MByte Image Buffer
- FPGA pre-processing for high throughput

Common specification

- Fully GigEV compliant interface
 - Software package including programmers' API and 3D Player software to acquire images and 3D point clouds close to real-time (see feature list below)
 - Various interfaces/Plug ins available*
 - Single 12V/1A power supply, power consumption typically 6.3W
 - Size: 120(L)x100(W)x50(H)mm
 - Weight: 800g (including lens)
- * see Software features

Model options

Model	Working distance [mm]	Measurement volume [mm ³]	Field of view [mm]	3D Point distance [µm]
SD-1	200	120x80x50	120	60
SD-2	100	60x40x25	60	30
SD-3	300	208x110x80	240	120
SD-V-X	variable	variable	variable	variable

Standard Software features

- Full sensor control
- Predefined operating modes for draft, regular and high resolution processing, user mode with full access to processing parameters
- Selectable acquisition & processing algorithms
- Arbitrary cross sections and height maps through sample
- 2D triangulation (mesh generation)
- Depth map generation
- Export in various formats (STL, IGES, PLY, binary formats, ASCII Formats, ...)
- Plugins for Rapidform®, Geomagic®
- Interfaces for various standard machine vision software manufacturers
- Calibration (V-options)

Advanced Software features

- Adaptive 3D Triangulation, points decimation
- Mesh combining (registration)
- Noise & Data Filtering
- Watertight mesh conversion
- Shape matching

