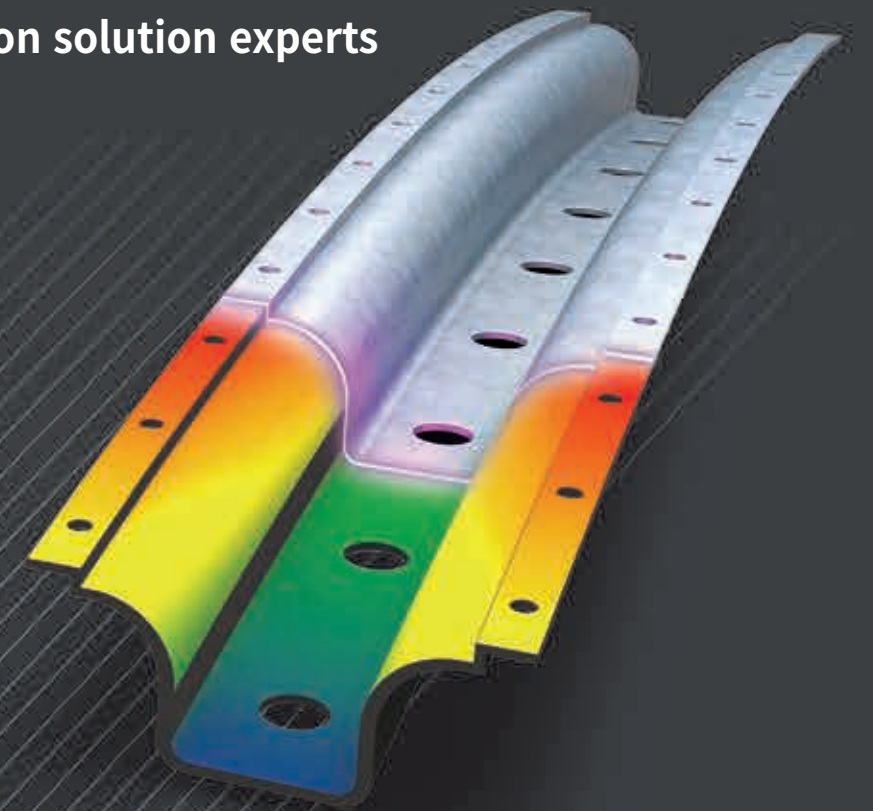
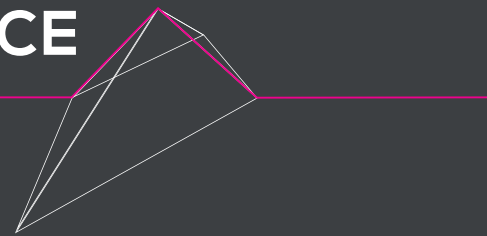


INDUSTRIAL 3D AUTOMATION EXPERT

Industrial 3D automation solution experts

CREATIVE
MEASUREMENT
SCIENCE



CMES inc.

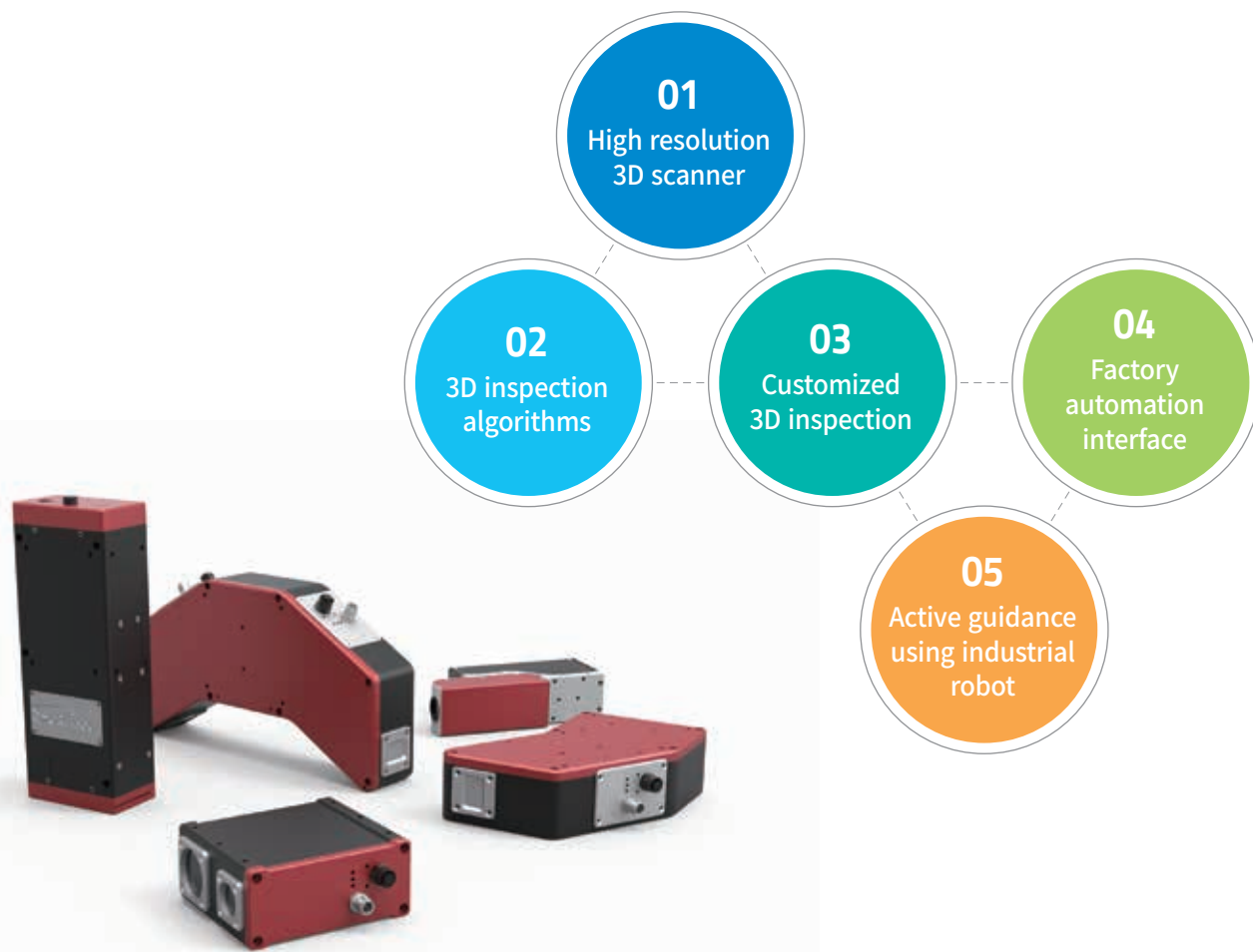
HQ NNFC E19 9F 291, Daehak-ro, Yuseong-gu, Daejeon, Republic of Korea
R&D center 4F 27, Seolleung-ro 127-gil, Gangnam-gu, Seoul, Republic of Korea
Tel +82-50-5355-6011 Fax +82-50-5355-6009 E-mail sales@cmes.kr

CMES
Creative MEasurement Science

CMES

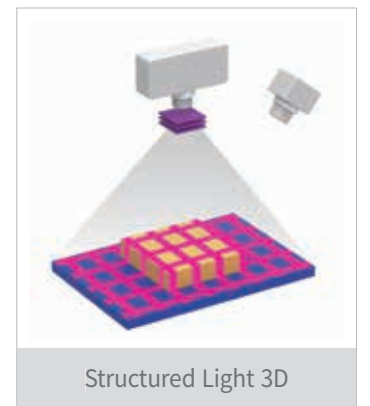
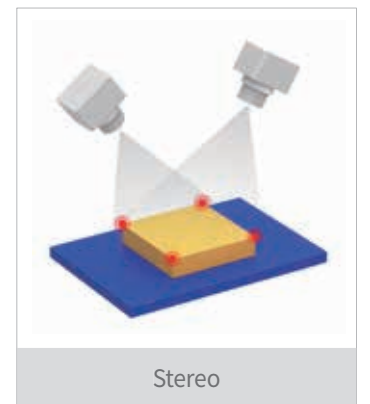
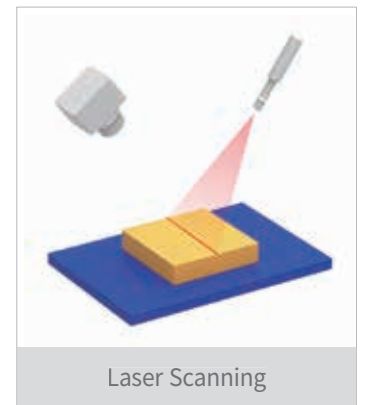
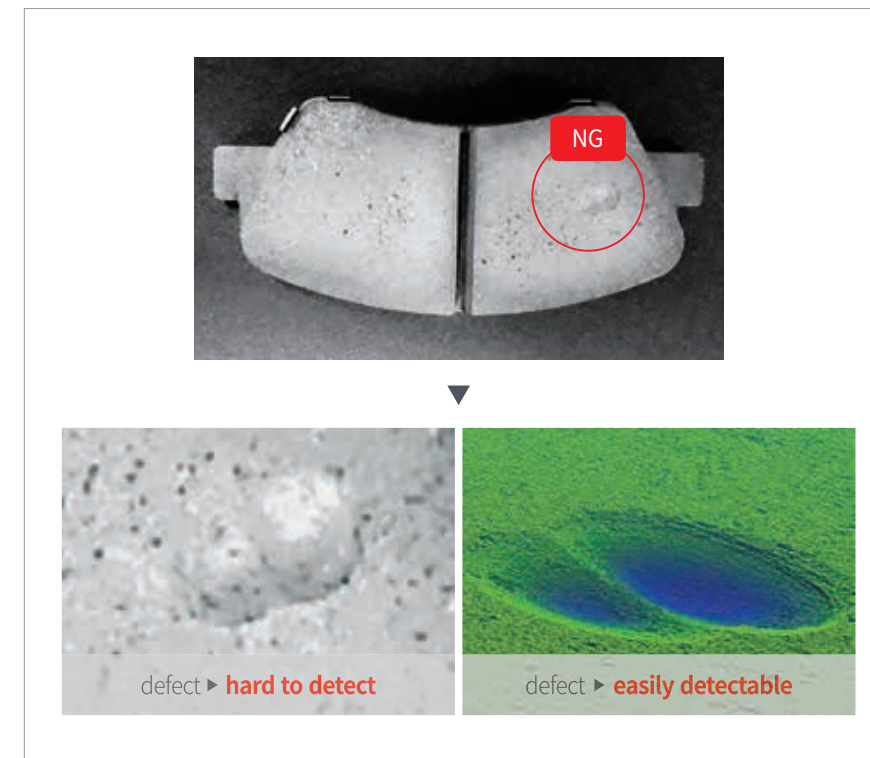
Creative MEasurement Science

CMES inc. is now providing state-of-art high resolution 3D scanners, inspection algorithm, automation applications on a wide variety of production site based on engineering experiences in automated inspection over 15 years.



Superb performance from 3D inspection

More than 90% of automated inspection system is adopting 2D image processing. 2D image processing can use only the brightness, and unable to utilize height information. This can make 2D image processing miss defects, therefore causing quality control issues. On contrary, 3D inspection can dramatically improve detecting performance by utilizing height information.



CMES Inc. with its years' of experience in 3D measurement, is now leading 3D-based factory automation. With proprietary 3D scanner and 3D algorithm, CMES can provide more advanced level of FA, compared with competitors using off-the-shelf 3D scanner and 3D library. CMES can also overcome prior limit of adopting industrial robots by combining 3D scanner with 3D space calibration and position guidance.

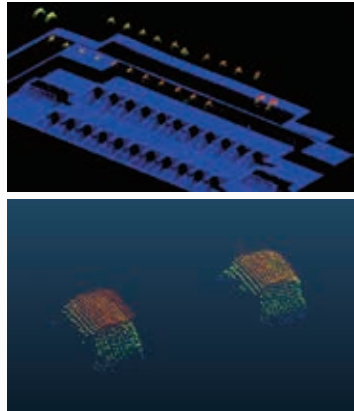
Application 01

Connector Pin 3D Inspection

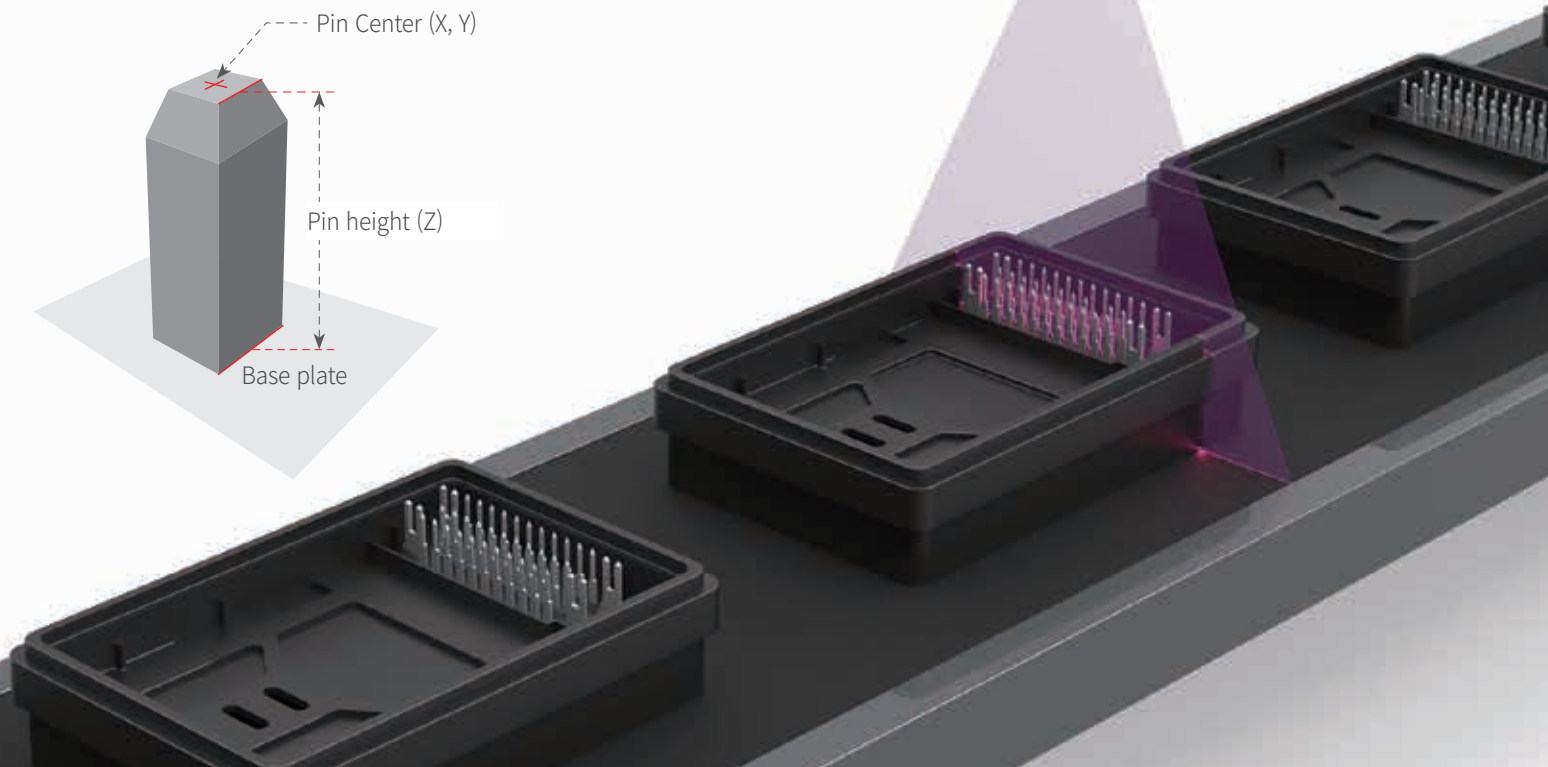
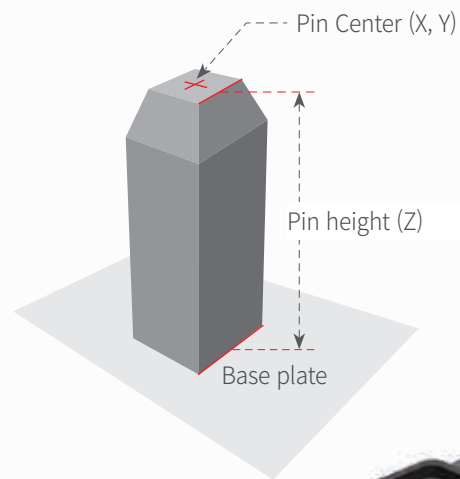
- Proprietary high resolution 3D scanner and software package
- Multiple application records

Main features

- Measurement of pin's X,Y bent & height value (Z)
- Measurement of deviation of distance between adjacent pins
- SW tools for inspecting multiple models with single 3D scanner
- Embedded database for monitoring inspection result
- Comparison of design and measured value using Master Jig



Accurate measurement with reduced optical noise



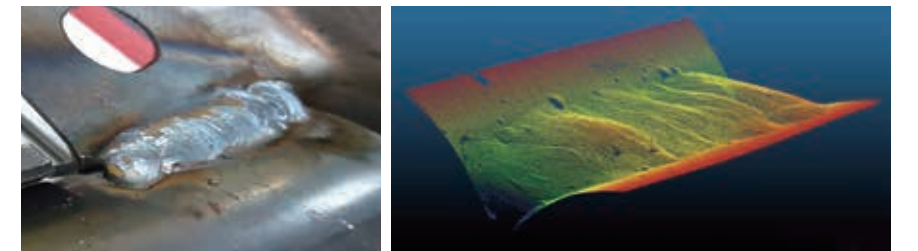
Application 02

Weld Bead 3D Inspection

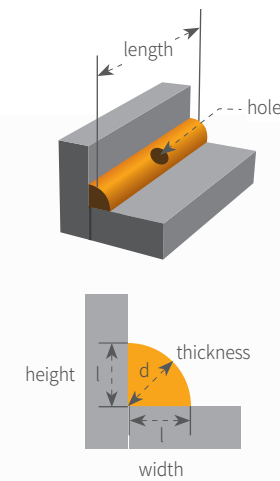
- Weld bead 3D inspection with high resolution 3D scanning
- Multi-Link robot solution for 3D scanning of complex shape

Main features

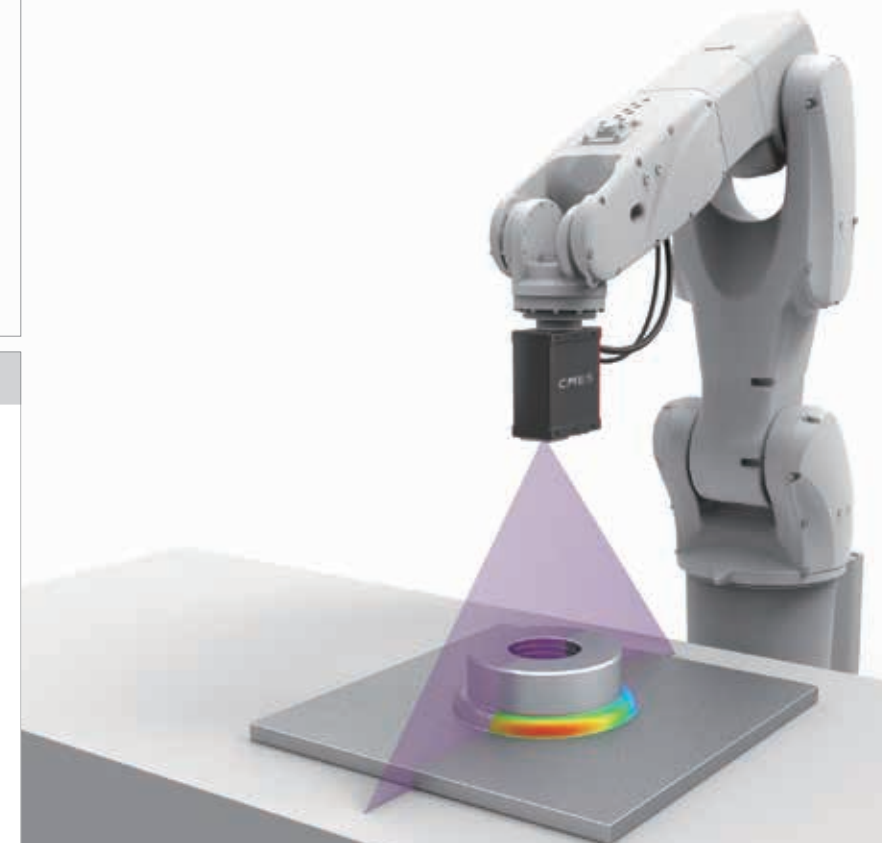
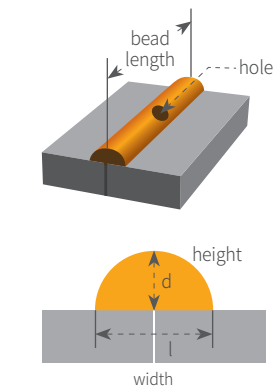
- Weld bead Length, width and height measurements
- Detecting air holes
- Inspection of weld beads with complex shape



Joint(Fillet) weld



Groove weld



Application 03

Sealant 3D Inspection

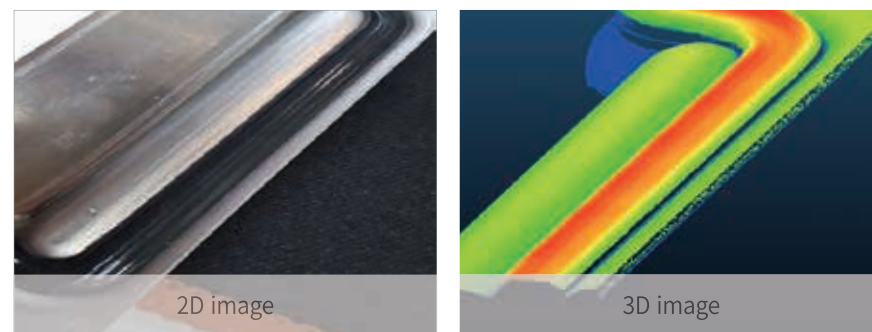
- Sealant shape inspection including height & volume measurement
- Improved accuracy using 3D scanning over cross-section profile measurement

Main features

- Presence/absence & disconnection
- Width, length, height, and volume of each section
- Dispenser feedback control with applied amount of sealant
- Inspection of sealant shape with diversified color and path
- Fast inspection speed enabling total inspection



Example Sealant sample for Waterproof



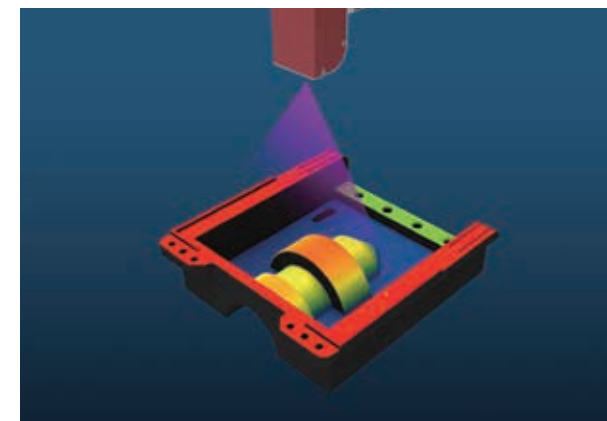
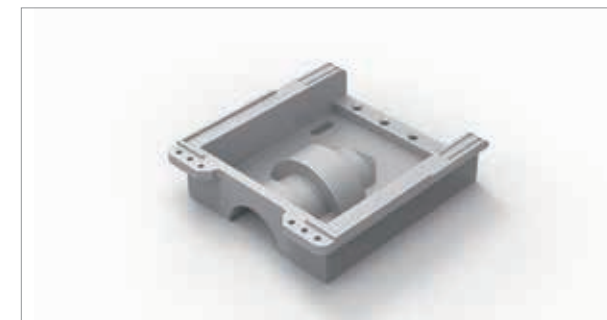
Application 04

Diecasting 3D Inspection

- Finding defects on diecasting products
- Optional sensor choices according to inspection specification. (Low-resolution/ High-resolution)

Main features

- Measurement Surface flatness
- Detect particles and Barrel stone
- Hole boss crack & height
- Tiny burr inspection (available for high-resolution option)



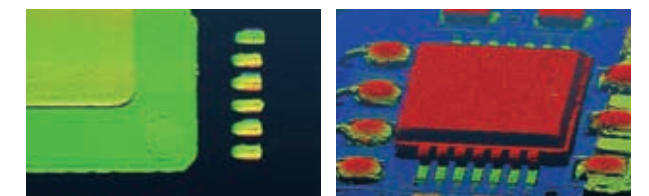
Application 05

Semiconductor 3D Inspection

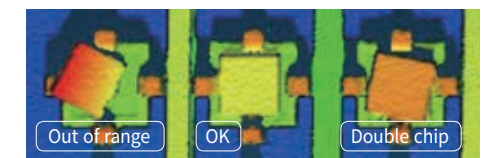
- Detecting various defects from semiconductor inline process
- High-speed and high-precision scanner

Main features

- Semiconductor Package height measurement
- Wafer warpage inspection & dimension measurement
- Tray chip Presence/absence & Position, 3D OCR
- Chip lead bent (X, Y, Z)



▲ Chip lead bent ▲ PCB assembly inspection



▲ Tray Chip inspection



▲ 3D OCR

Application 06

3D Robot Vision

Harmony between 3D scanner & industrial robots

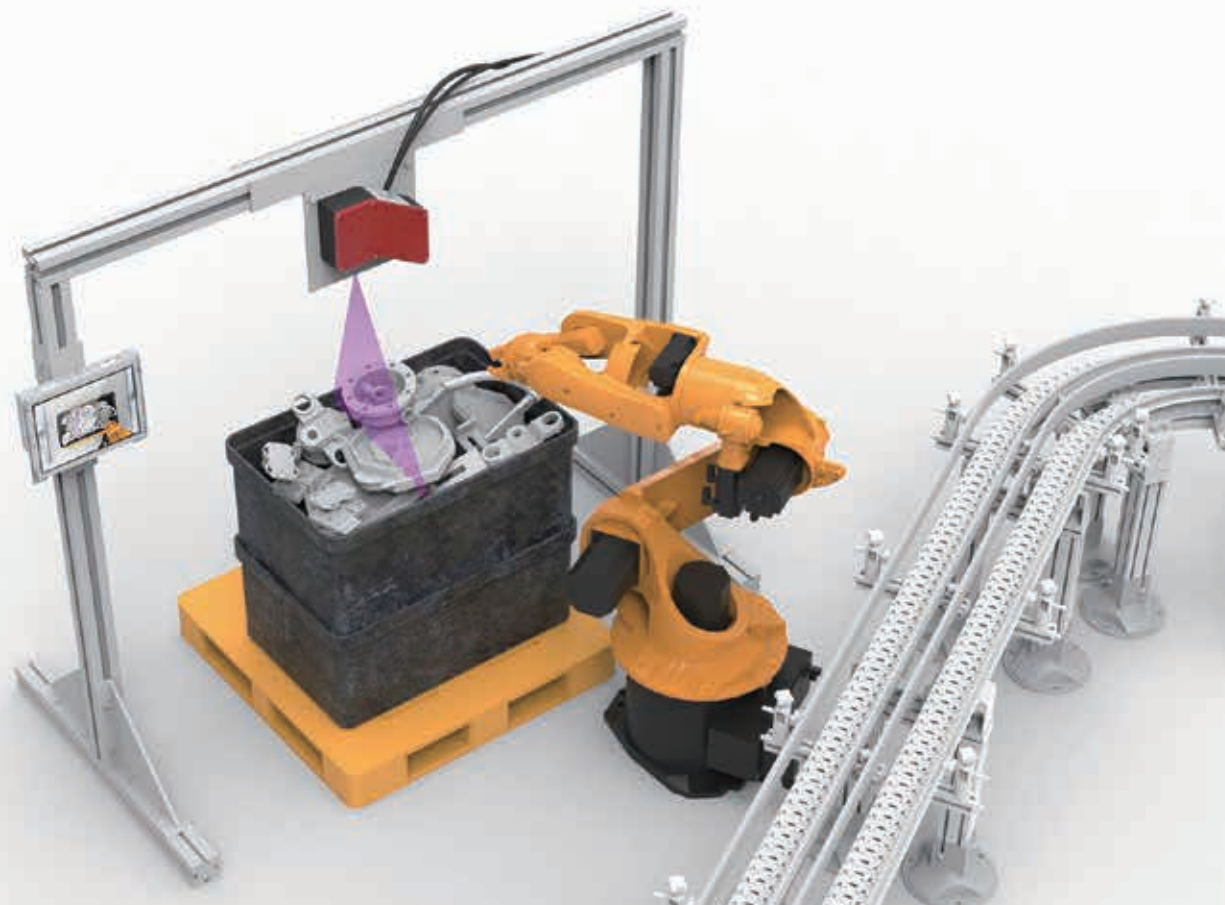
Active robot guide using 3D scanning data beyond robot teaching
Precise robot location guide with 3D calibration using 3D scanner and industrial robot

Main features

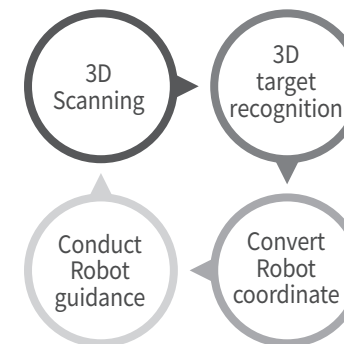
- Position recognition (3D scan data & CAD data matching tool)
- Real time tracing of 3D shape and specific points
- Accurate Space coordinate calibration between Robot & 3D scanner
- Automated periodic 3D calibration for ensuring measurement accuracy
- Applicable to various grippers and robot actuators (6-axis robot, scalar robot, and delta robot)
- Compatible with commercial industrial robots (KUKA, ABB, YASKAWA, DENSO, Hyundai heavy industry)

3D RANDOM BIN PICKING

Firstly, detects the location and direction of the registered products by 3D-scanning in the pallet, then the robot pick up & place on promised position for next procedure.



Next Gen. Automated Robot System



Active 3D robot guide

Industrial robots moving path creation accomplished by tracing Extracted 3-dimensional characteristics (sealant, painting, welding, and taping etc.)
Applicable in complex geometry assembly & inspection robot guide

Main Applications

- Automated painting system of complex and flexible objects
- Automated welding system for rigid joint
- Automated Sealant dispenser with precise position guide
- Automated logistics system for objects with various shape & size



3D measurement of large objects using multi-axis robot

3D measurement accuracy unaffected from position error of objects
Measurement of complex shape with 3D scanner and robot's end effector
Recognition of reference plane, shape recognition (X, Y, Z), distance between shapes, and deviation from master/design



Product 01

SURFinder S/D Series

SURFinder S-series

- High resolution image sensor (2K pixels / profile)
- High quality Blue (450nm) / Purple (405nm) Line Laser (Class III)
- Large format optical lens
- Over 3 years long laser lifetime (changeable)
- Optical filter avoid light interference
- Pre-calibrated 3D scanner
- 4th generation sensor of CMES inc.



SURFinder D series

- Dual-high resolution image sensor (avoid occlusion)
- Accurate Dual 3D calibration
- Fast processing time & critical measurement for geometric target



Specification

Spec. \ Model	S35	S45	S61	S241	D61
Scanning width	35mm	45mm	60mm	240mm	60mm
Resolution	2,048 pixels / profile				4,096 Pixels / Profile
Planar resolution	18um/Pixel	22um/Pixel	29um/Pixel	117um/Pixel	29um/Pixel
Z-Repeatability (Dependent on surface)	±1um~10um	±3um~20um	±4um~25um	±10um~100um	±4um~25um
Sampling rate	500 ~ 10,000 profile / sec (according to ROI size)				
Line Laser	Standard : 450nm, 405nm as option				
Laser Class	Class III (customizable)				
Laser lifetime	Over 3 years - replaceable				
Operating Temperature	0 ~ 40 degrees Celsius				
Main application	<ul style="list-style-type: none"> · Connector Pin inspection · Sealant inspection · Weld bead inspection · High Precision 3Dmeasurement 		<ul style="list-style-type: none"> · Weld bead inspection · Die-casting inspection · Robot bin-picking · Robot active guide · Box volume measurement · Fast & big-size target 3D inspection 		
Warranty	1 year				

Product 02

All-in-one Smart Vision Platform

CUP_V1

- Quad-core intel CPU processor
- On- board image processing
- Changeable optics (C, CS mount)
- Light solution support
- Multi array solution support
- Add-on laser module (Flatness, height measurement _ optional)
- Easy SW platform (Script based)
- Factory interface
- Multi I/O channel
- Single Power 12V



Specification

Spec. / Model	CUP_V1
Resolution	5 Megapixel
Max Resolution	2,592 x 1,944 pixels
Color	Monochrome / Color
Frame rate	14fps
Light	High Power LED
Processor	Quad-core intel Processor
Operating System	Windows 10
Storage	32GB
Memory	2GB
Digital I/O	Input : 2 (photo-coupler), Output : 4 (Relay)
Power consumption	12V / 3A
Dimension(mm)	112.4mm × 165mm × 27.2mm (X×Y×Z)
Inspection item	Target size, position, distance, presence/absence