

3D Optical Profilometer

2D/3D Inspection Within 1 Second



3C Electronics



Precision Hardware



IC Chip/Semiconductor



Lithium Battery



Ultra-high repeatability: 1μm



Absolute accuracy: 20μm



Ultra-large FoV: 62mm x 62mm



Ultra-high-speed dynamic measurement



Simultaneous output of 2D/3D images



Complete SDK and one-stop software support

Product Description

- Hypersen DBL series products are 3D visual inspection sensors using new flash measurement technology, which feature high recognition accuracy, wide FoV and short detection cycle time.
- Equipped with a high-performance vision controller and a 40G optical fiber for high-speed data transmission, HPS-DBL series sensors can achieve high-precision 2D and 3D shape inline measurement within 1 second, suitable for various 3D inspection applications in the fields of 3C, semiconductor, PCB, and precision workpieces.

3D Optical Profilometer

Hypersen



3D Optical Profilometer



3D Line Confocal Sensor



Chromatic Confocal Sensor



High Speed Industrial Camera



6-Axis Force Torque Sensor



Laser Tool Setter



Laser calibration sensor



3D Solid-state LiDAR



ToF Ranging Sensor

Sensor Head



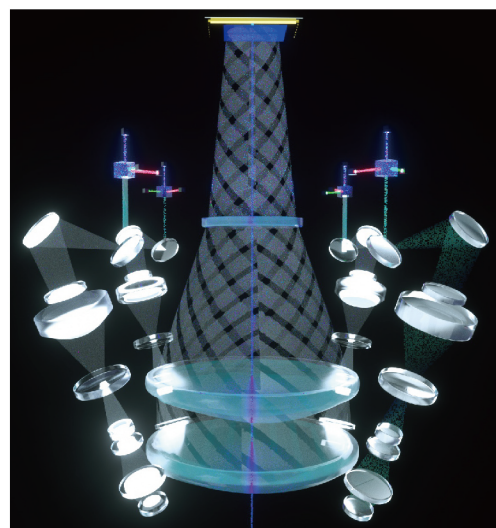
Controller



Principle Introduction

· Hypersen 3D Optical Profilometer adopts ultra-high-speed projection method to project special patterns of different wavelengths to the measurement object and then collects pattern information on the target surface. Then, the high-performance vision controller (HPS-NB3200) and its built-in AI decoding algorithm will process the data in real time to obtain full-view and high-precision 2D color images and 3D point cloud data.

· The sensor head projects patterns in 4 directions with 4 projection units, so it can collect complete pattern information even if there are complex depth changes on the object surface, which means there are no shadowing effects.





Excellence • Beyond Precision

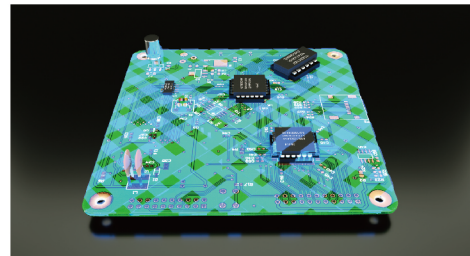
Excellence • Beyond Precision

Perfect Inspection Method for Complex Scenarios

Product Advantages

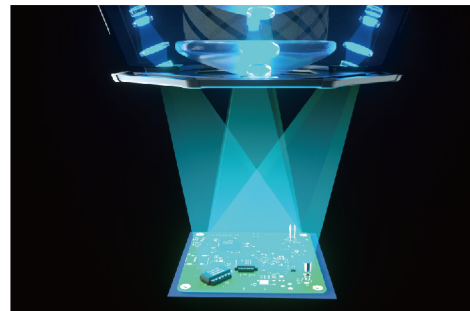
High-precision Inline 3D Inspection

- Using the industry's top CMOS photosensitive element and ultra-low distortion telecentric optical system, the sensor obtains high-precision 3D data by just one shot.
- Under high-speed and real-time measurement circumstances, the absolute accuracy can reach 20μm (Repeatability: 1μm).



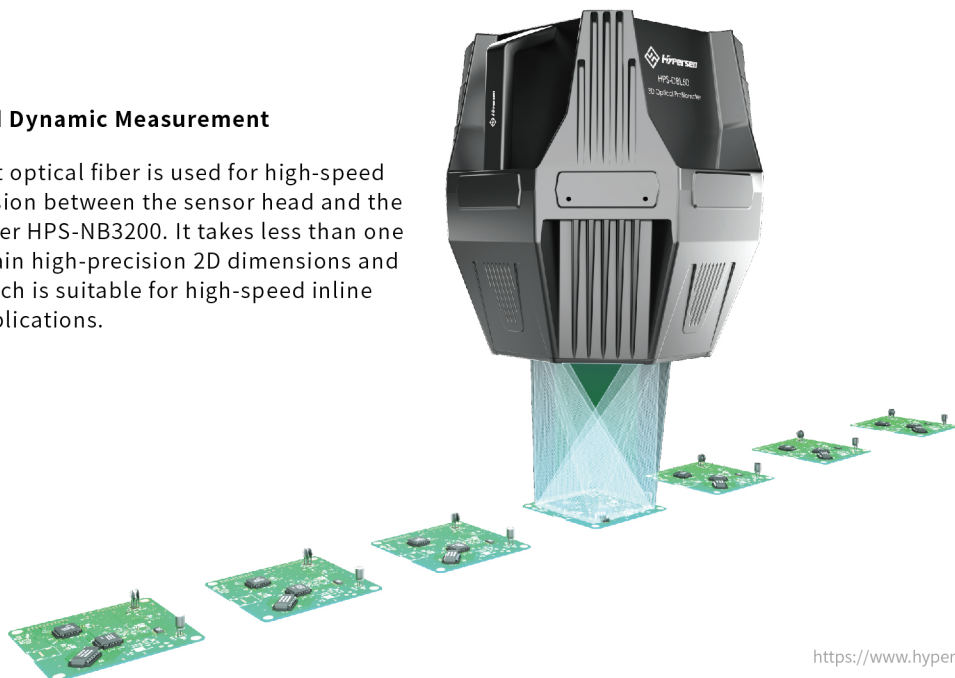
Large FoV, Plane Measurement, Cover the Full FoV

- No blind spots because of its symmetrical multi-angle projectors.
- The sensor measures not only the 2D dimensions of a workpiece, but also its height, 3D profile and volume.
- It is suitable for large-scale measurement scenarios with the FoV of 62mm x 62mm.



Ultra-high-speed Dynamic Measurement

A 40G Ethernet optical fiber is used for high-speed data transmission between the sensor head and the vision controller HPS-NB3200. It takes less than one second to obtain high-precision 2D dimensions and 3D profile, which is suitable for high-speed inline inspection applications.



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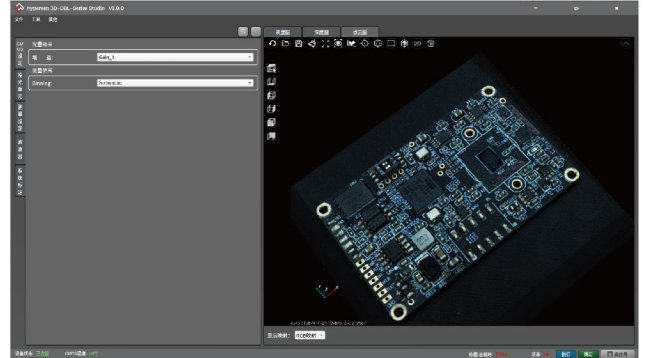
Product Advantages

Efficient AI Software Algorithm

- The XY data interval is averaged to control the individual differences of the imaging system.
- Brand new 3D profile processing and 2D image optimization algorithms.
- Self-developed light projection algorithm reduces invalid pixels in glossy areas due to multiple reflections.

Complete SDK and one-stop software support

- Easy to integrate with simple software system



Application Scenarios

Manufacturing
3C Electronics
Semiconductor
New Energy
Scientific research
Medical



Precision Workpiece Inspection

PCB and IC Chip Inspection

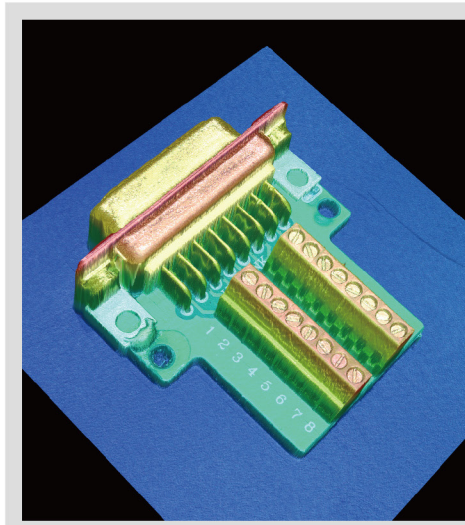
Medical Parts Inspection

Battery Appearance 3D Inspection

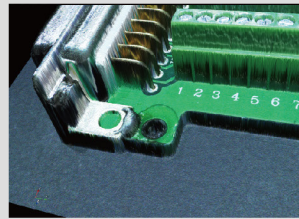
3C Products Measurement

It is suitable for various industrial inline inspection scenarios. For example, it can realize micron-level detection of complex materials in the fields of 3C, semiconductor, lithium battery, metal workpiece, and PCB.

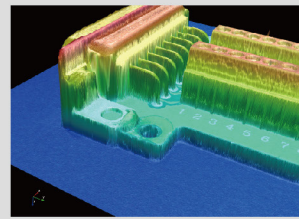
Captured Images



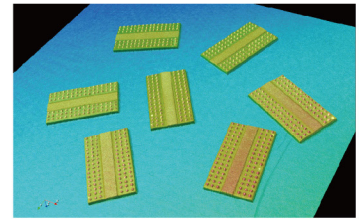
IC Chip Inspection



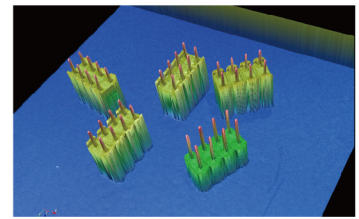
RGB point cloud image



Depth point cloud image

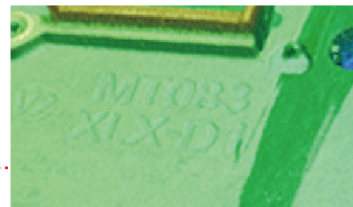
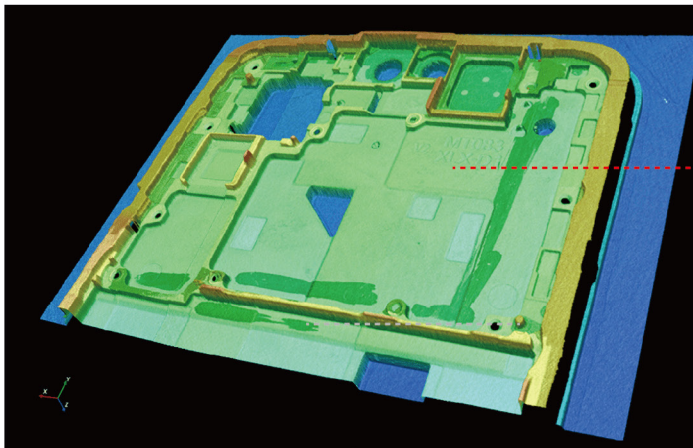


solder ball inspection



PIN detection

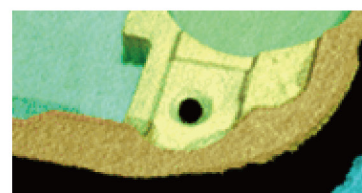
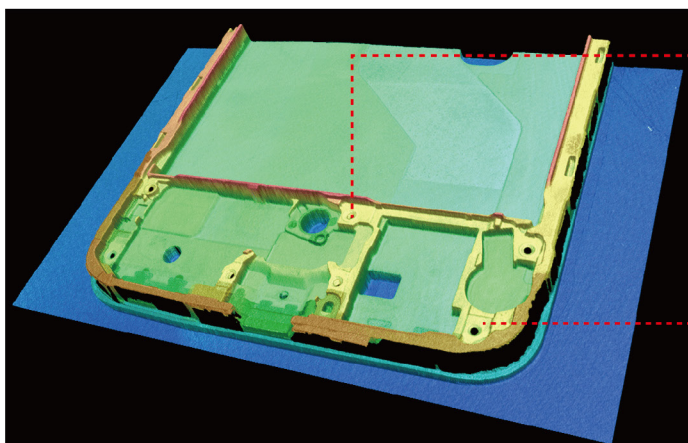
Mobile Phone Middle Frame Inspection



Optical character recognition (OCR)



Flatness measurement



Step height measurement

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HyperSen

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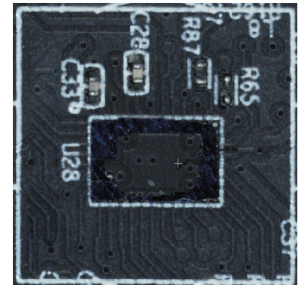
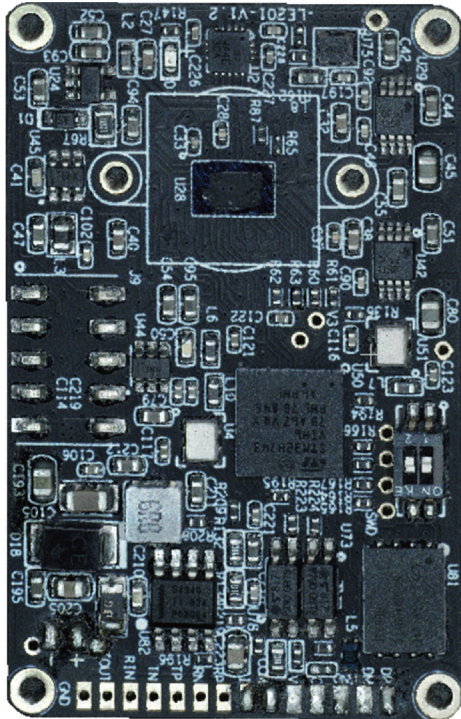
Laser calibration sensor

3D Solid-state LiDAR

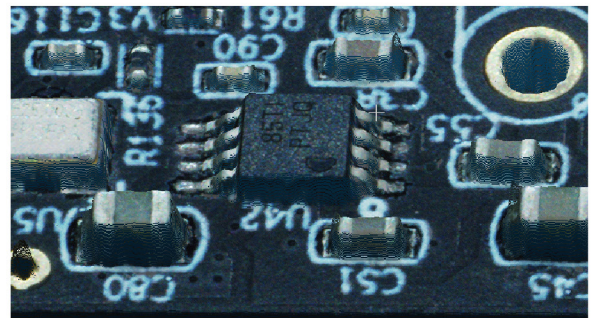
ToF Ranging Sensor

Captured Images

Circuit Board

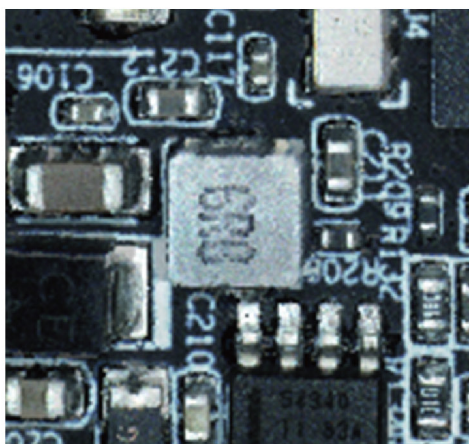


Metal foil damages detection



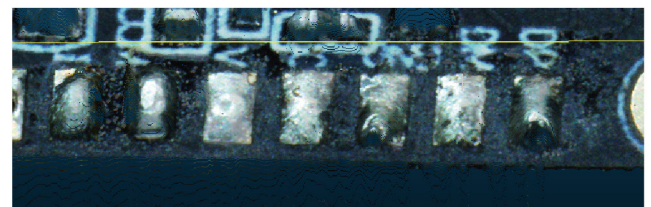
3D inspection of IC chip height, width, tilt, etc.

Ordinary area scan cameras can only acquire the specified parts features of an object through area information. But the 3D camera can obtain the depth information of the surface and digitize it.



OCR/Edge/Defects Detection

It can get 2D color images and realize components presence/absence test and feature location through profile recognition.



IC Chip Solder Joints Measurement

Able to calculate the height difference of each surface by measuring actual dimensions. Complete cross-sectional area and volume measurements of blocks.

Different FoV and Accuracy for Different Applications

Product Specifications

Model		HPS-DBL60	HPS-DBL25
Image sensor		10 megapixel CMOS sensor	
2D/3D image	Size	3200x3200 (1600x1600) pixels	3200x3200 (1600x1600) pixels
	XY data interval	19.7μm (39.4μm)	7.85μm (15.7μm)
Repeatability (σ) *①		1μm *②	0.5μm *②
Measurement accuracy (Height difference/width) *③		±20μm *③	±10μm *③
Field of view		62x62mm	25x25mm
Measurement range		±6.5mm	±2.2mm
Shutter speed		50μs~200ms	
Stand-off distance(mm)		195mm	
Light source		LED (red, green, blue), can be set separately across 120 levels	
Controller connection		HPS-NB3200	
LED display		Power supply, operation mode	
Power voltage & current consumption		DC 24 V±10%; 5A	
Working temperature		0~40°C	
Relative humidity		20-85%RH (no condensation)	
Dimensions		276x276x290mm	276x276x290mm
Weight		≈10.3kg	≈9kg
Components		Sensor head, controller, optical fiber	

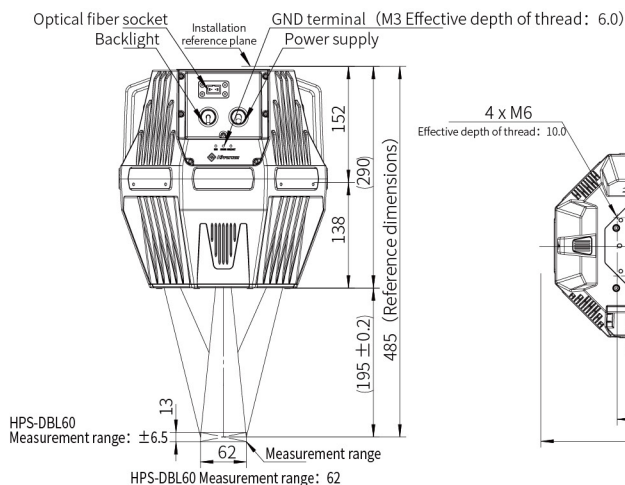
① Uses 3*3 median filter and a Hypersen standard workpiece

② Repeatability at the center of FoV (HPS-DBL60: 30x30 mm; HPS-DBL25: 12x12mm)

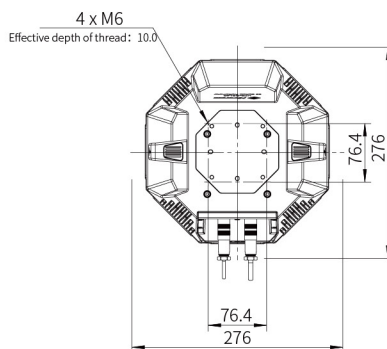
③ Uses a Hypersen standard height difference gauge. HPS-DBL60: height difference - 2mm/ width - 20mm; HPS-DBL25: height difference - 1mm/ width - 10mm

Product Dimensions

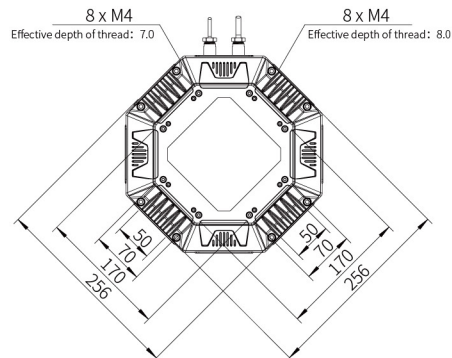
HPS-DBL60 Sensor Head --



Rear View



Top View



Bottom View

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