利珀科技
Leaper Technology

V2026.2.0

LP-PICS60C

IC Packaging Measurement and Inspection Equipment

Hangzhou Leaper Technology Co., Ltd.

About LEAPER

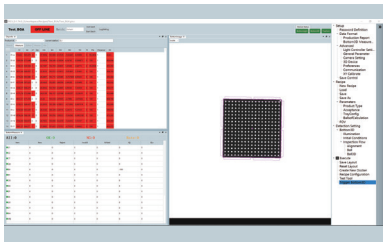
LEAPER specializes in providing industrial inspection solutions by using machine vision. The core technologies include self-developed optical imaging system, machine vision algorithm and graphical algorithm integration platform. We offer solutions for various application scenarios, providing product quality monitoring, production traceability, manufacturing process optimization, and high-precision mechanical positioning and guidance. LEAPER is headquartered in Lin' an District, Hangzhou City, China, and has established branches and subsidiaries in Yuhang (Hangzhou), Hefei, Suzhou, Shenzhen, and Chongqing.

LP-PICS60C

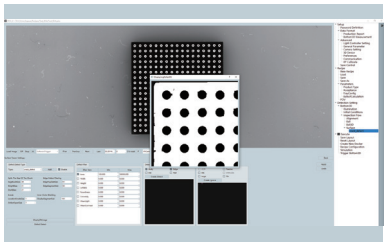
Self-developed Lead Scan is one of the core equipment in the semiconductor packaging and testing process. Lead Scan is used after chip packaging is completed, where it performs measurement and defect inspection of the package exterior using optical imaging technology. It is compatible with a wide range of package types, including but not limited to BGA, CSP, QFP, QFN, and LGA. The equipment integrates cutting-edge technologies in the machine vision industry, including high-speed positioning and handling, high-precision 2D/3D optical modules, PICS semiconductor-specific software, and AI-based deep learning. It enables comprehensive quantitative analysis of key parameters—such as package warpage, coplanarity, and lead geometry—and captures and classifies defects in finished chips.

PICS Semiconductor Algorithm Software

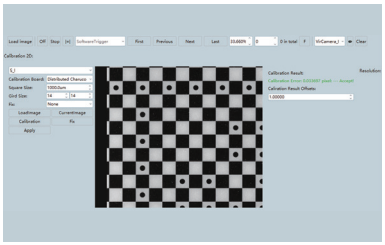
PICS is LEAPER' s self-developed, versatile machine vision software designed for the advanced packaging industry. It integrates light source control, camera connection, camera calibration, visual parameter adjustment, recipe management, high-precision measurement, defect detection, operational dashboards, and data output. With its high speed, precision, and user-friendly interface, PICS is ideal for both production operations and easy parameter configuration.



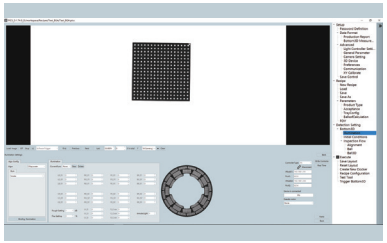
Main interface



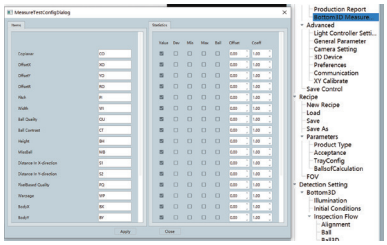
Defect inspection



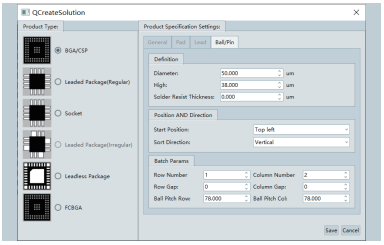
Calibration



Lighting



Measurement items

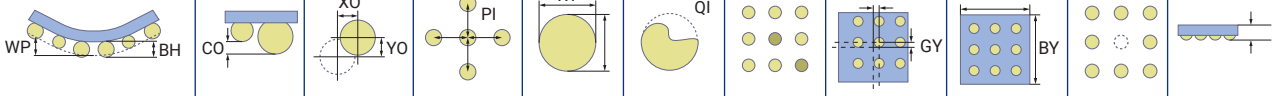


Create product type

Lead Scan Inspection Items and Accuracy

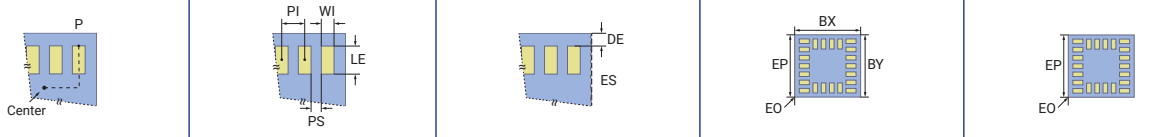
BGA

Warpage	Ball Height	Coplanarity	Offset	Pitch	Ball Width	Ball Quality	Contrast	Grid-to-package Offset	Body Width Body Height	Ball Presence Absence	Component Height
5 μm (0.2 mil)	5 μm (0.2 mil)	5 μm (0.2 mil)	5 μm (0.2 mil)	5 μm (0.2 mil)	5 μm (0.2 mil)	20%	7 gv	9 μm (0.35 mil)	9 μm (0.35 mil)	v	10 μm (0.4 mil)



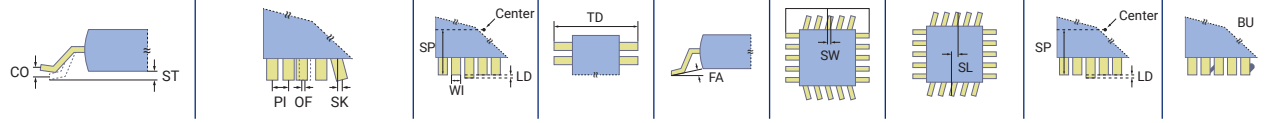
QFN / BCC

Position	Pitch, Width, Lendth, Pad Spacing	Distance to Edge Edge Straightness	Body Width/ Body Height Edge Parallelism Edge Orthogonality	Edge Parallelism Edge Orthogonality
5 μm (0.2 mil)	5 μm (0.2 mil)	5 μm (0.2 mil)	6 μm (0.3 mil)	0.1 degrees



Gull Wing

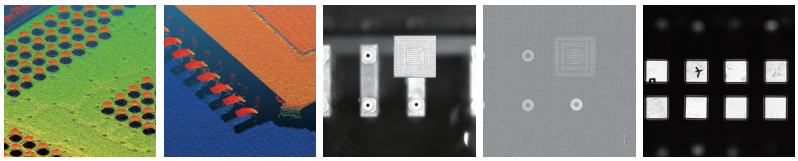
Lead Coplanarity	Body Standoff	Lead Offset/Skew	Lead Pitch	Lead Width	Terminal Dimensions	Foot Angle	Lead Sweep	Lead Slant	Half Span Lead Length Dev.	Burr
5 μm (0.2 mil)	10 μm (0.4 mil)	4 μm (0.16 mil)	5 μm (0.2 mil)	7 μm (0.28 mil)	12 μm (0.48 mil)	0.75 degrees	5 μm (0.2 mil)	5 μm (0.2 mil)	10 μm (0.4 mil)	Minimun burr 40 μm

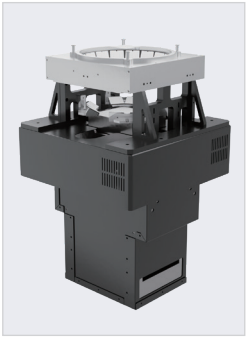


Lead Scan Inspection Modules

Bottom 2D/3D Vision Module

Performs bottom-side dimensional measurement and defect inspection of ICs, including but not limited to ball coplanarity, ball/pin/pad size, pin pitch, missing, extra, broken, or off-center balls, and passive component defects.

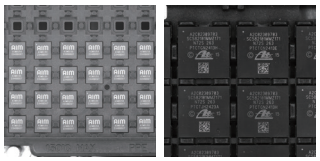


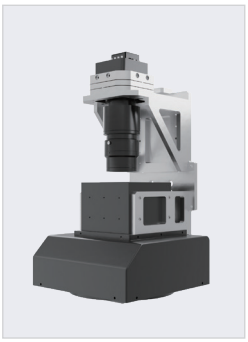


Parameter Performance	
FOV	60 × 60 mm (2.36 × 2.36 in.)
XY Lateral Resolution	12 μm
Pixels Per FOV	5120 × 5120
3D Sensor Height Resolution	< 0.2 μm
Repeatability	4 μm (3 σ)
Accuracy	± 3 μm
Minimum Feature Diameter	110 μm
Measurement Range	± 1 mm
3D Acquisition Time (Dwell), Typical	300 msec
Maximum Allowable Motion during Acquisition	3 μm
L × W × H	423.4 × 423.4 × 691 mm
Weight	≈ 31 kg

Top 2D Vision Module

Performs top-side OCR recognition on IC products and detects surface defects, such as scratches, dents, dirt, and damage.



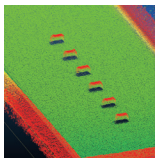


Parameter Performance	
FOV	52 × 52 mm
XY Lateral Resolution	10 μm
Pixels Per FOV	5120 × 5120
Min Defect	20 μm
Min Character Stroke Width	40 μm
Min Character Height	0.23 mm
Minimum grey value difference	30
L × W × H	254 × 254 × 462 mm
Weight	≈ 15 kg

Lead Scan Inspection Modules

Top 3D Vision Module

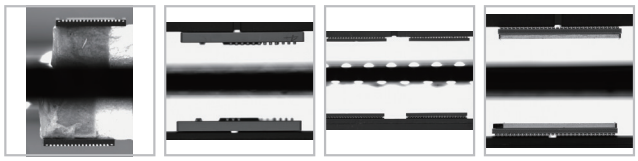
Performs IC top-side dimensional measurement and defect inspection, including solder ball coplanarity, solder ball / pad size, lead (pin) pitch, missing / excess / damaged / shifted solder balls and missing or defective components.



Parameter Performance	
FOV	26 × 26 mm
XY Lateral Resolution	11 µm
Pixels Per FOV	5120 × 5120
3D Sensor Height Resolution	0.3 µm
Repeatability	4 µm (3 σ)
Accuracy	± 3 µm
Minimum Feature Diameter	110 µm
Measurement Range	5 mm
3D Acquisition Time (Dwell), Typical	400 msec
Maximum Allowable Motion during Acquisition	3 µm
L × W × H	350 × 450 × 350 mm
Weight	≈ 9 kg

4 Sides Vision Module

Performs simultaneous bilateral dimensional measurement and defect inspection for multiple components in a single shot.

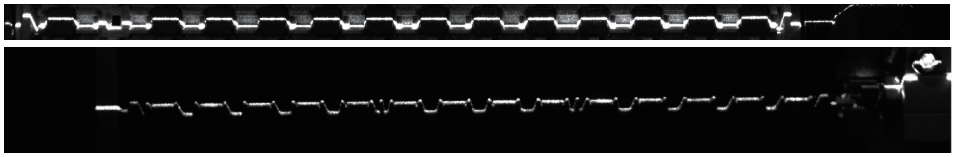


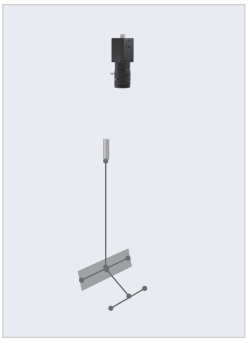
Parameter Performance	
FOV	10 mm × 80 mm
Pixels Per FOV	9344 × 7000
Repeatability	10 µm
Accuracy	10 µm
Resolution	0.01 mm/pixel
Minimum Feature Diameter	20 µm
Maximum device size	80 mm
L × W × H	660 × 272 × 780 mm
Weight	≈ 30 kg

Lead Scan Inspection Modules

PIC Vision Module

Detects missing, stacked, or misaligned chips during tray unloading.





Parameter Performance	
FOV	150 mm × 113 mm
Pixels Per FOV	2592 × 1944
Repeatability	40 µm
Accuracy	60 µm
Resolution	0.057 mm/pixel

Tape & Reel Vision Module

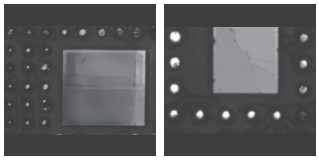
Detects defects such as missing components in pockets, cover tape misalignment, surface damage, and scratches before and after Tape & Reel. Measures heat seal width and carrier tape hole dimensions, and determines product orientation and heat seal position.

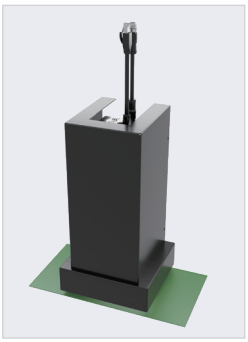
Parameter Performance	
FOV	60 mm × 48 mm
Pixels Per FOV	1280 × 1024
Resolution	0.048 mm/pixel

Lead Scan Inspection Modules

IR Module

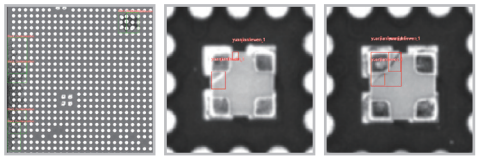
Performs through-die inspection of IPD-type dies on finished chips, enabling detection of defects such as micro cracks.





AI Module

IntelliBlink-AI is an AI platform independently developed by LEAPER for the field of vision inspection. It provides functions including sample labeling, sample generation, model training, model validation, data visualization and open integration for user-defined models. It supports applicaitons such as image classification, object detection, image segmentation and unsupervised anomaly detection. One of its key features is image sample generation, which can create a large number of training images from a very small set of samples, effectively addressing a major challenge in rapidly deploying vision AI projects in industrial scenarios. After importing the AI models into PICS —— also independently developed by LEAPER and integrating high-speed, high-precision defect detection and other functionalities —— the efficiency of defect inspection in the semiconductor packaging industry can be significantly improved.



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