



MAKER-RAY

AIS50X-HW

Inline Double-sided PCBA Optical Inspection Equipment

01

Difficult to avoid secondary defects

Secondary defects may occur due to movement or collision.

02

Difficult to inspect special components

Traditional AOI cannot directly detect boards with special processes such as double-sided SMD and "sandwich".

03

High cost of defective loss

The price of circuit boards is high, and their craftsmanship is intricate. If defects are not detected in time, they might be scrapped during testing, leading to extremely high costs.

AIS50X-HW

Inspect defects on Top and Bottom of PCBA

Rapid

AI Intelligent Identification. Easy Operation to program fastly.

Strong

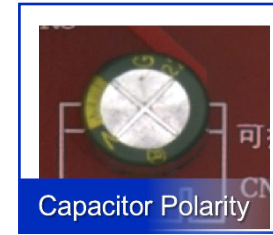
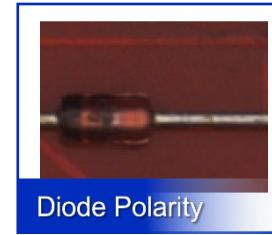
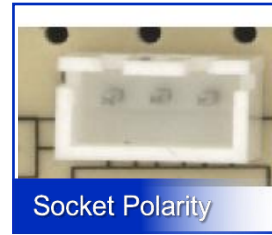
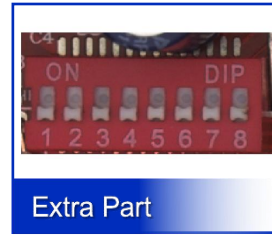
Multi-dimensional extraction of tens of thousands of features, strong detection capability.

Special

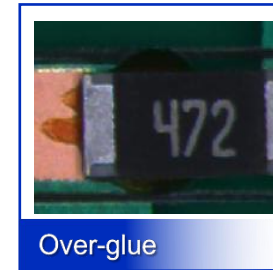
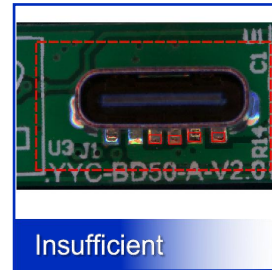
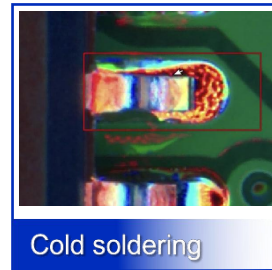
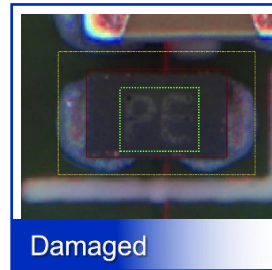
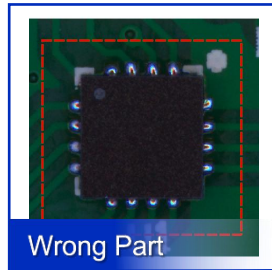
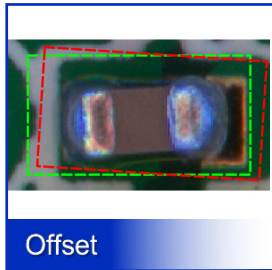
Developed special light source and algorithm to meet the needs of special components detection.



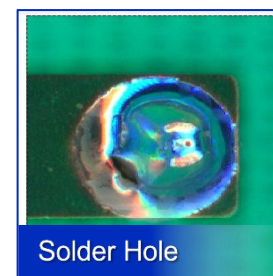
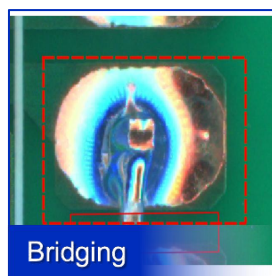
Manual Insert Components (MI)



SMD/ Solder of SMD

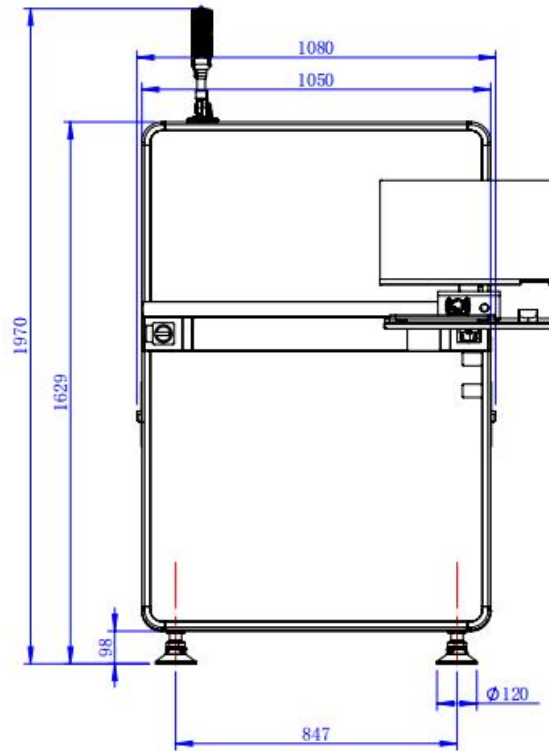


Solder of MI

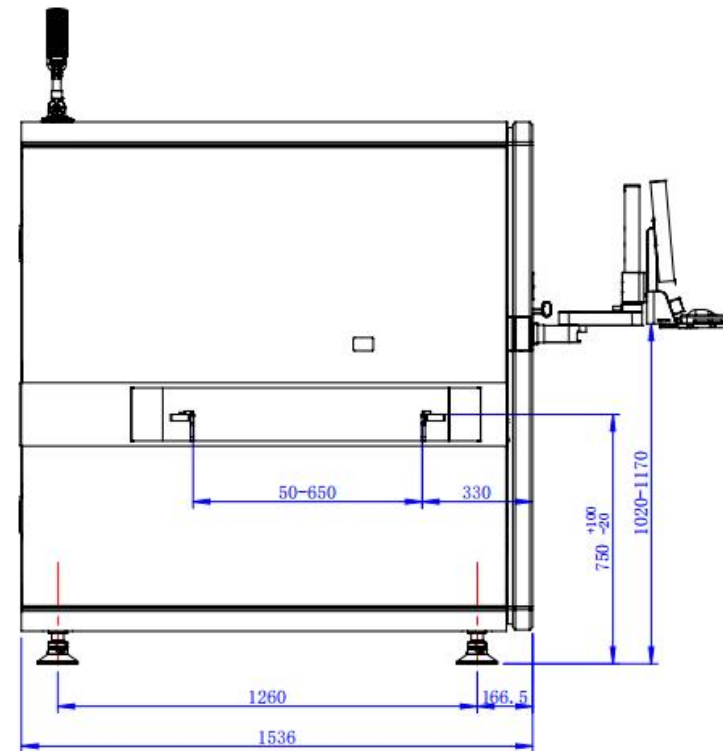


AIS50X-HW Architecture Diagram

Flexible layout for final inspection post-reflow, post-wave or before packaging, which is **compatible with different inspection scenarios**, effectively intercepting defects and ensuring quality.



*AIS501-HW (750 Height)

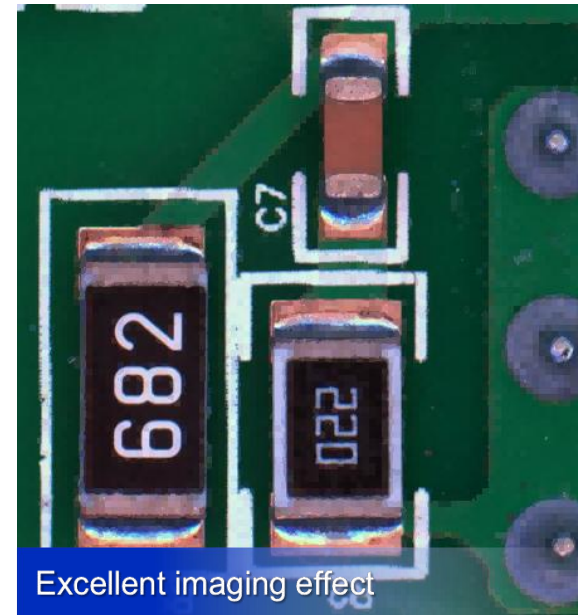
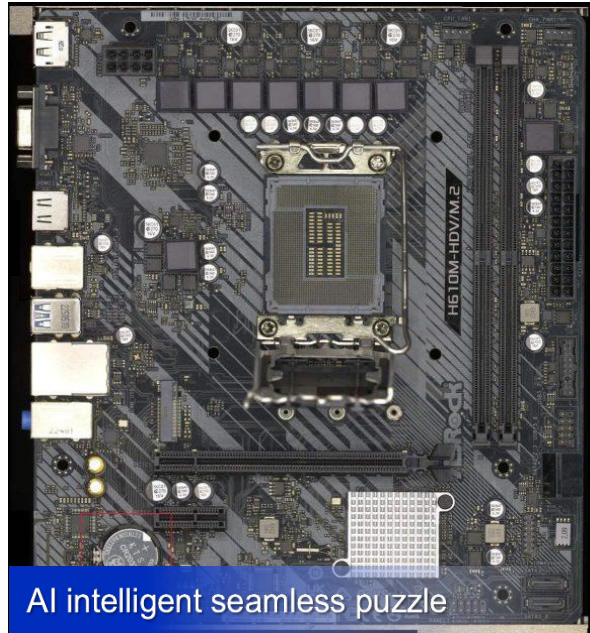


Unit, mm

Developed Special Light Source System for Better Imaging Effect

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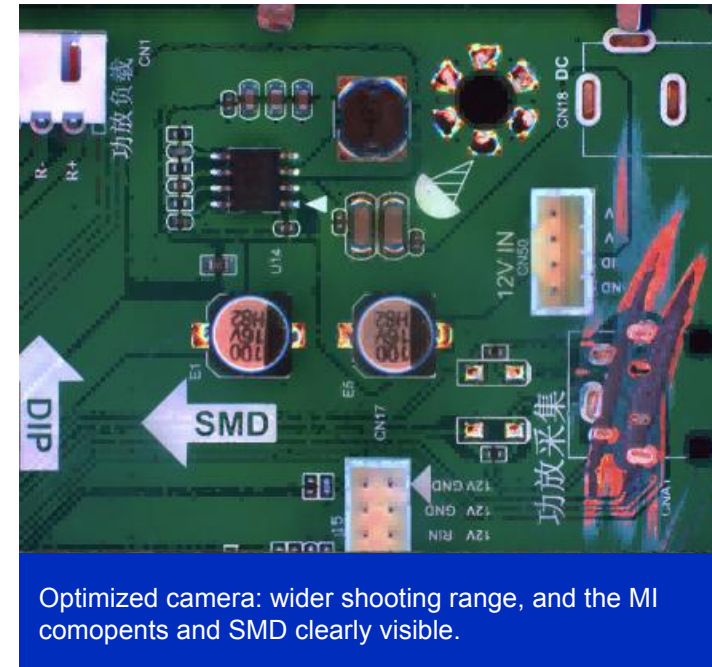
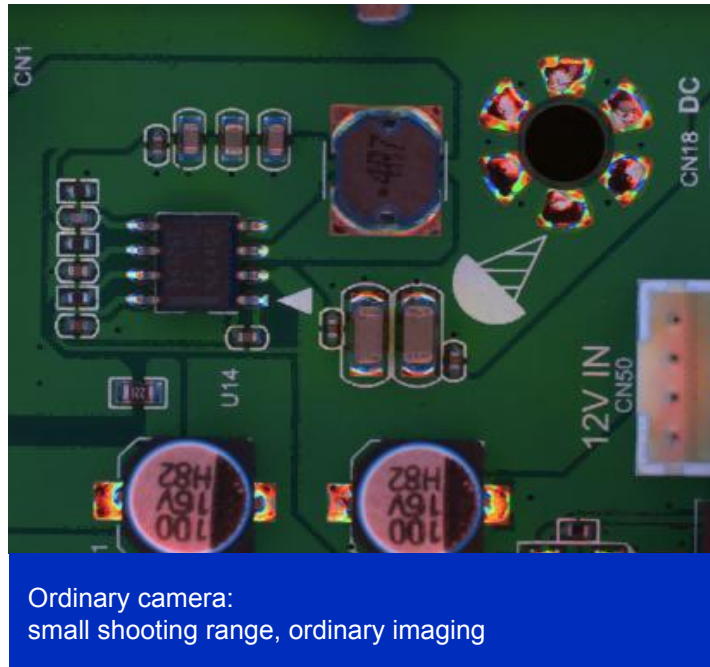
Independently developed multi-channel light source, compatible with different inspection items such as MI components, SMD and solder, etc., **effectively improves the saturation and brightness of the imaging**. Combined with **AI intelligent seamless puzzle technology** for more natural splicing.



Scientific Camera Structure Design. Compatible with Higher detection

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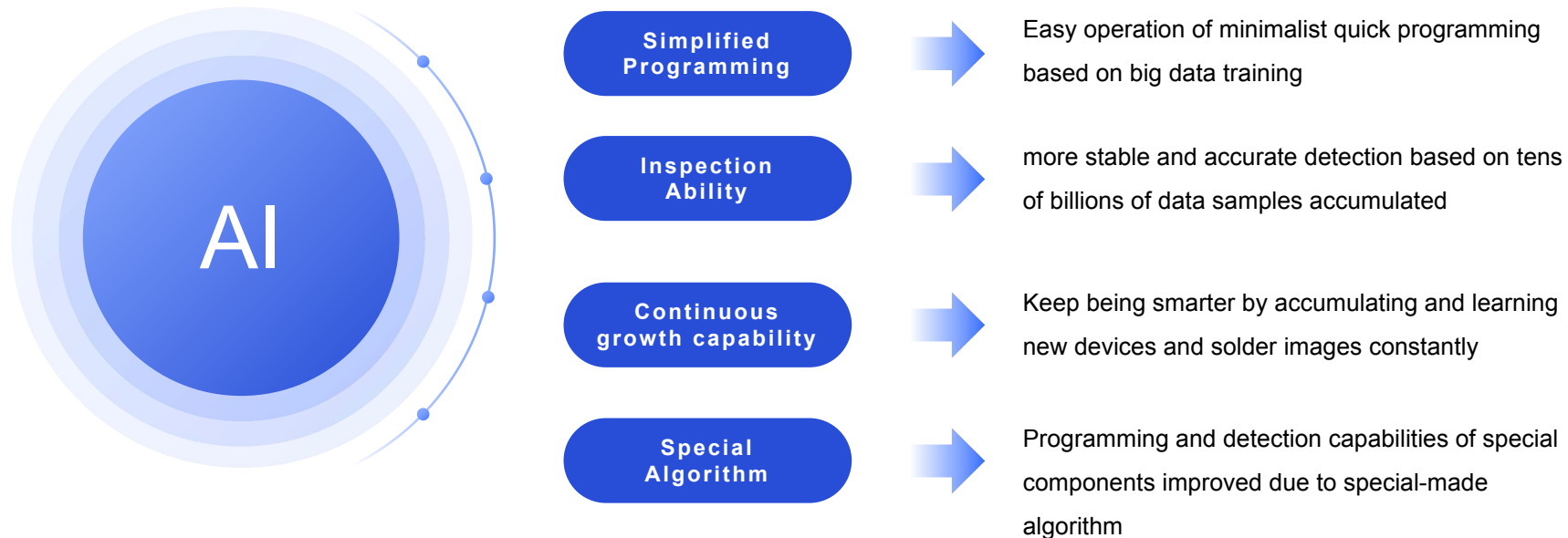
Self-developed and optimized lens design for improving DOF while ensuring detection accuracy, meeting the needs of **higher-altitude component detection and with a larger shooting range.**



Core Technology: AI Deep Learning Algorithm

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Deep learning networks can create multiple levels of abstract layers to represent data features, and filter through the classification layer of features to obtain recognition results. When applied to industrial optical inspection, it can **improve programming efficiency and inspection accuracy**.



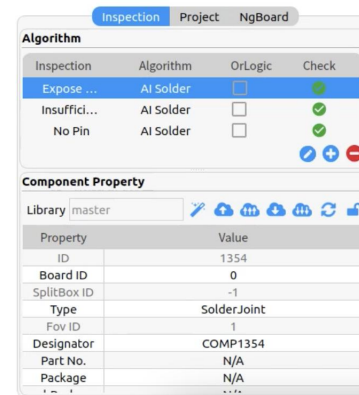
One-click identification of trained THT solder and configuration of detection algorithms to auto-adjust parameters. **Simple operation**, no reliance on engineer experience, greatly **improved programming speed**, **easy to use**.



Billions of data samples support precise AI algorithm models

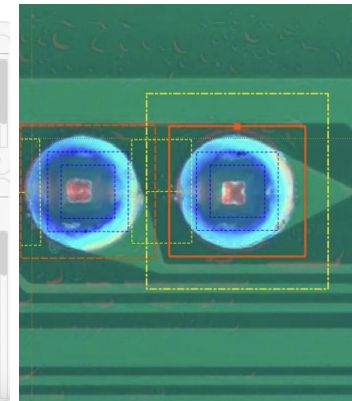


Cover a variety of testing items and will be higher in the future



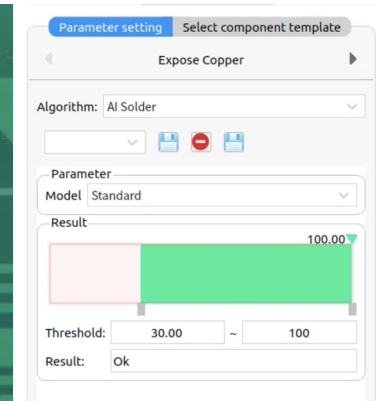
Intelligently configure algorithm

Determine the type of solder to be detected based on the device and configure the algorithm



Automatic identification of solder joints

One-click search for solder joints and draing the inspection boxes on the entire board automatically

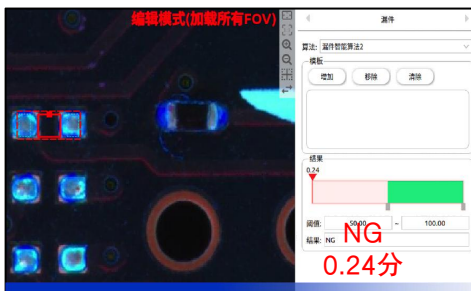


Intelligently bringup parameters

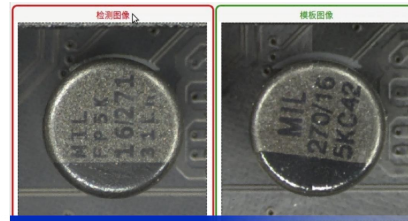
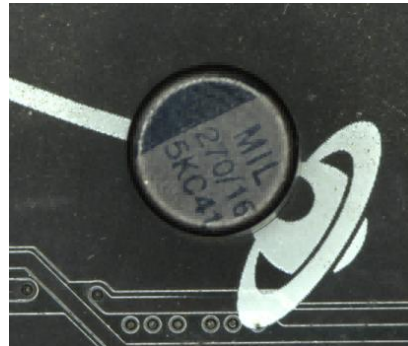
Intelligently configure parameters by default. Can also be adjusted manually

Strong Detection Capability and Strong Ability to Identify Complex Items

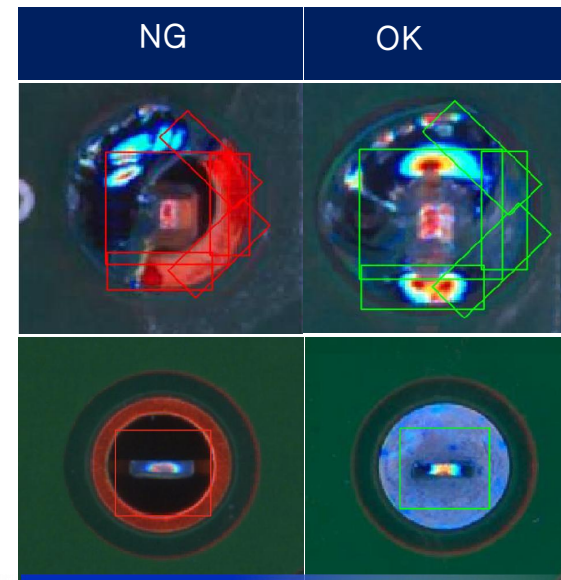
The model trained based on big data is compatible with complex situations such as device deviation, capacitor skew, solder joint morphology changes, similar colors, irregularly arranged devices, etc., and **has strong detection capabilities**.



*Black material on black board



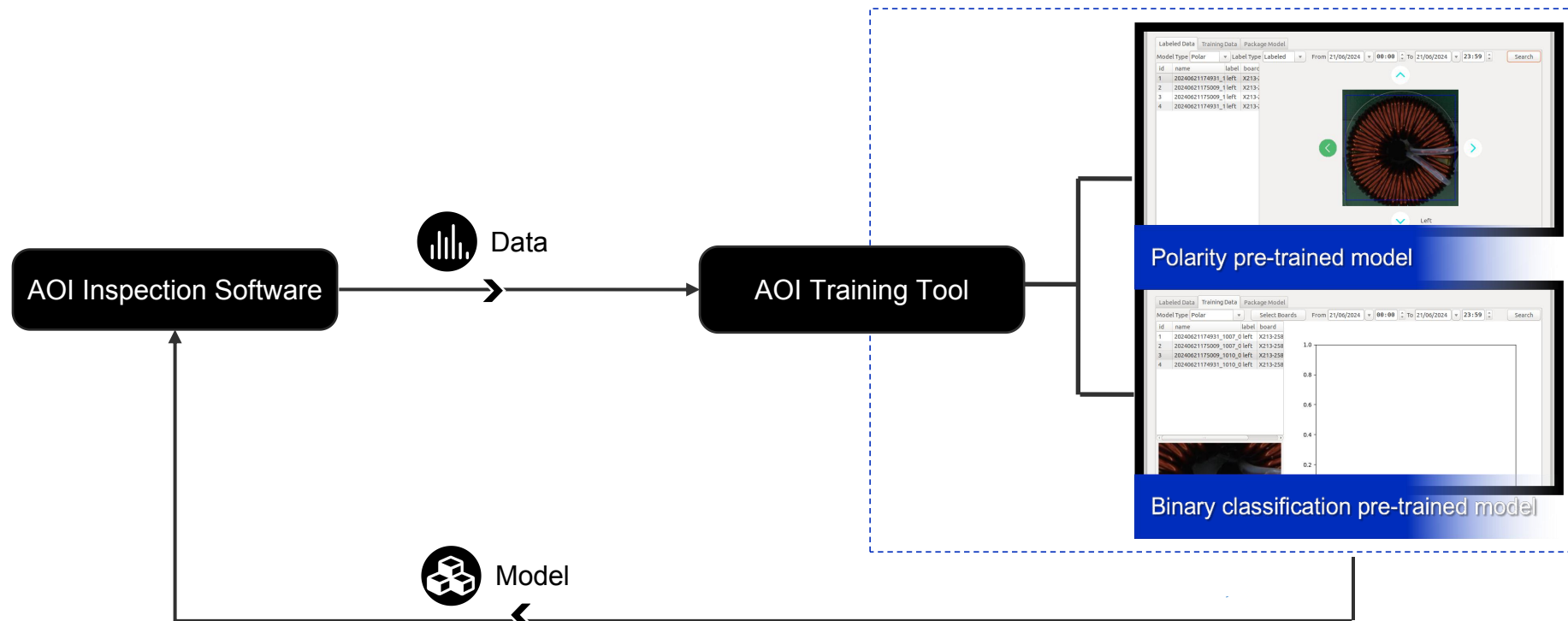
*Black gold capacitor wrong part/reverse polarity



*Solder hole detection

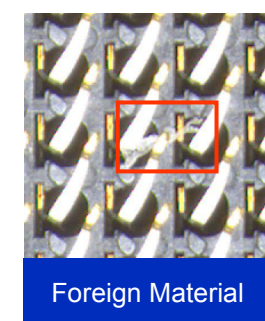
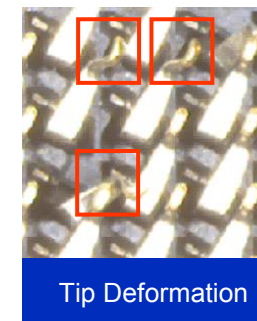
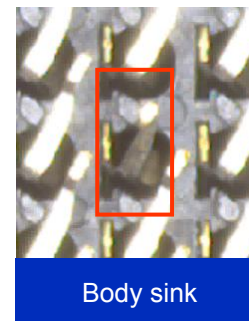
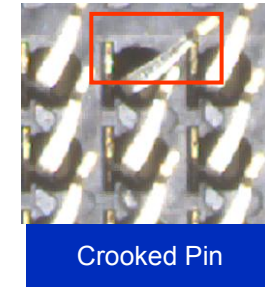
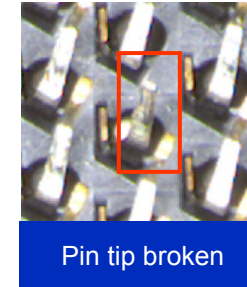
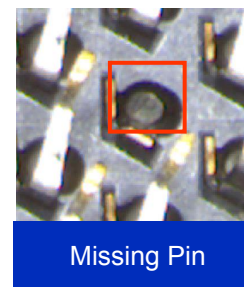
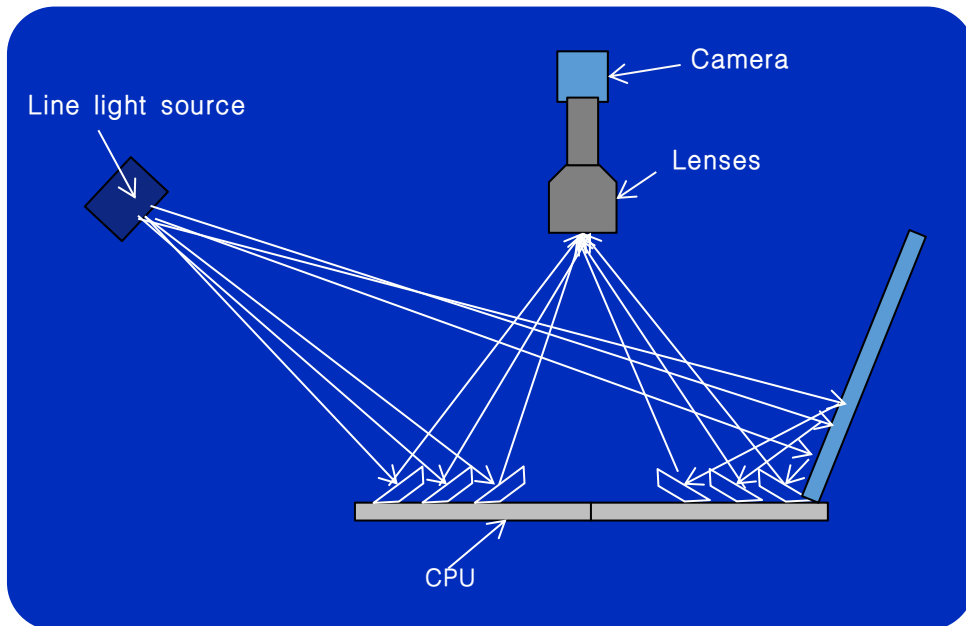
AI Self-training and Continuous Upgrading of Inspection Capabilities

The machine can conduct AI training autonomously, allowing the device to quickly **learn new and special components**, continuously iterate recognition capabilities, and improve inspection capabilities.



Researched CPU Pin Matching Algorithm for Strong Inspection

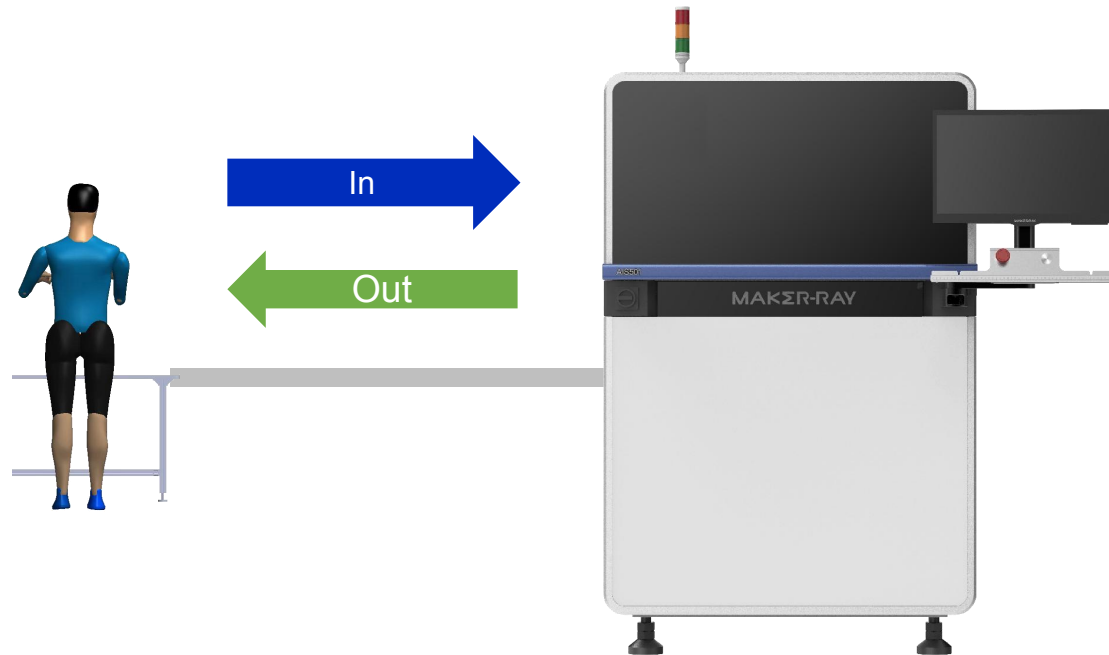
The **dedicated light source improves imaging effect**. Combined with the **CPU pin matching algorithm**, the entire CPU pin programming can be completed in 1 minute, covering a variety of defect types detection, supporting defect detection of needle tip, skewness with the body, breakage, foreign matter, subsidence, deformation, and missing pins.



R-R, L-L, R-L, L-R. Saving Labor Costs

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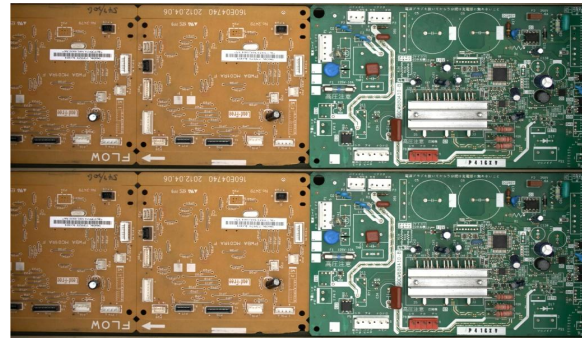
The board entry and exit modes can be customized, and the same-in and same-out mode can be applied in the final inspection offline mode to save downstream personnel costs.



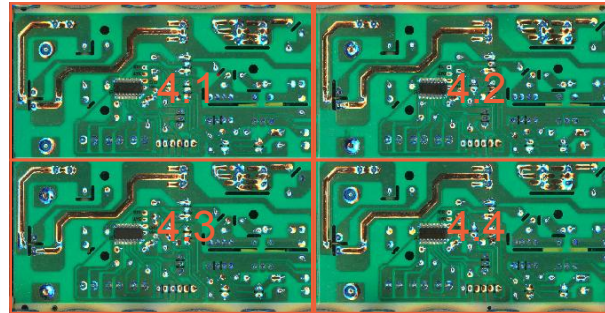
Rich Inspection Modes. More Practical

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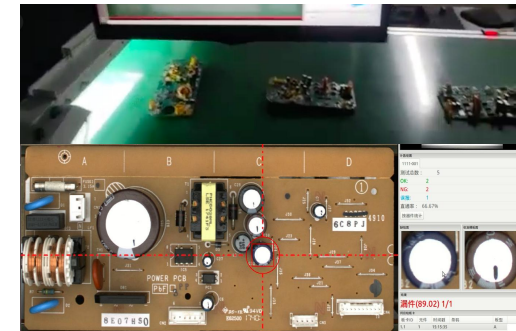
Various modes can be **setup to support different application**, such as alternative materials, post-wave mode use, etc., which is more practical.



Mixed board Inspection



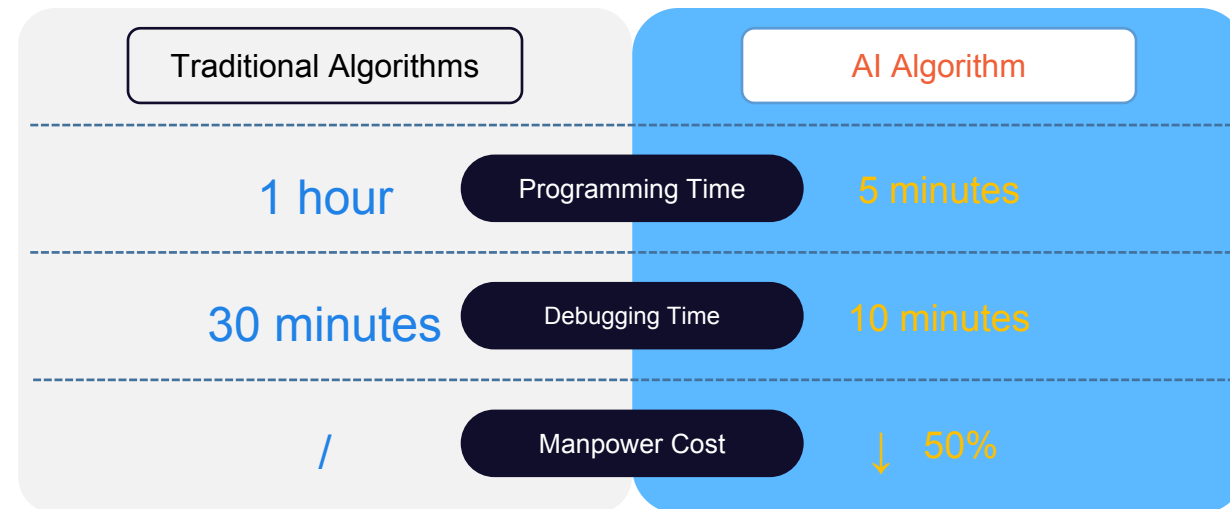
Multi-panel Inspection



Post-wave mode

➔ **Problem:** There is high-mixed & low volume factory who need to frequently change products, which **requires high programming speed**. Complicated Traditional AOI programming is time-consuming, easily cause board stacking and **affect the efficiency of long-line operation**.

➔ **Solution:** By MAKER-RAY AI One-click Searching, **a board with 500 inspection items, of which 450 can be auto-programmed**, reducing the number of components that need to be visually inspected by 90%, greatly improving the efficiency of visual inspection.



*Take the programming and testing of the same board as an example

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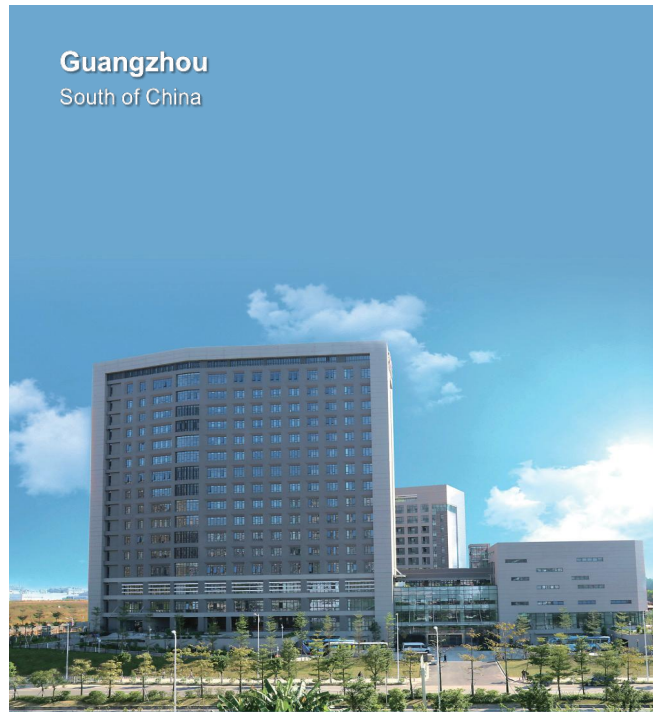
About Us



MAKER-RAY MAKER INDUSTRIAL INSPECTION EASIER

MAKER-RAY

MAKER-RAY focuses on the field of optical inspection in the **PCBA production process**. It is a high-tech enterprise integrating R&D, sales, and services. It adheres to the mission of "making industrial inspection easier", **drives innovation with technology**, and applies **deep learning algorithms to AOI** to provide companies with competitive optical inspection solutions.



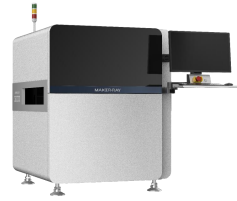
Complete Product Layout

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Dual in-line Package Inspection (THT)



Pre-Wave AOI



Post-Wave AOI

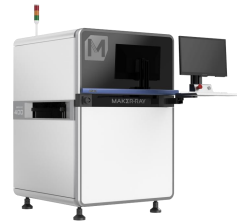


Double Sided AOI



Inline Repair Station

Surface Mount Inspection (SMT)



2DAOI



3DAOI



3DSPI

Surface Coating Inspection (Coating)



Single Sided CCI



Double Sided CCI

Three Institutes and One Research Station Provide Strong Support for Technology-driven Growth

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Academia Sinica

Over 10 years of experience in AI algorithms and machine vision, achieving innovative breakthroughs from traditional algorithms to AI algorithms

Central Academy of Engineering

Conduct research on engineering materials, innovative processes, standardized modular design, and simulation calculations to improve the reliability of equipment design

“3+1”

Innovation Design Institute

Conduct user scenario and human interaction research, gain insight into user pain points, provide design and experience solutions, and create an extremely user-friendly interactive experience

Postdoctoral Research Station

Obtained the qualification of Guangzhou Postdoctoral Innovation and Practice Base, established cooperative relations with well-known domestic and foreign universities and research institutions to ensure the supply of talents

Growth Curve

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Drives innovation with technology to provide companies with competitive optical inspection solutions.

1200%

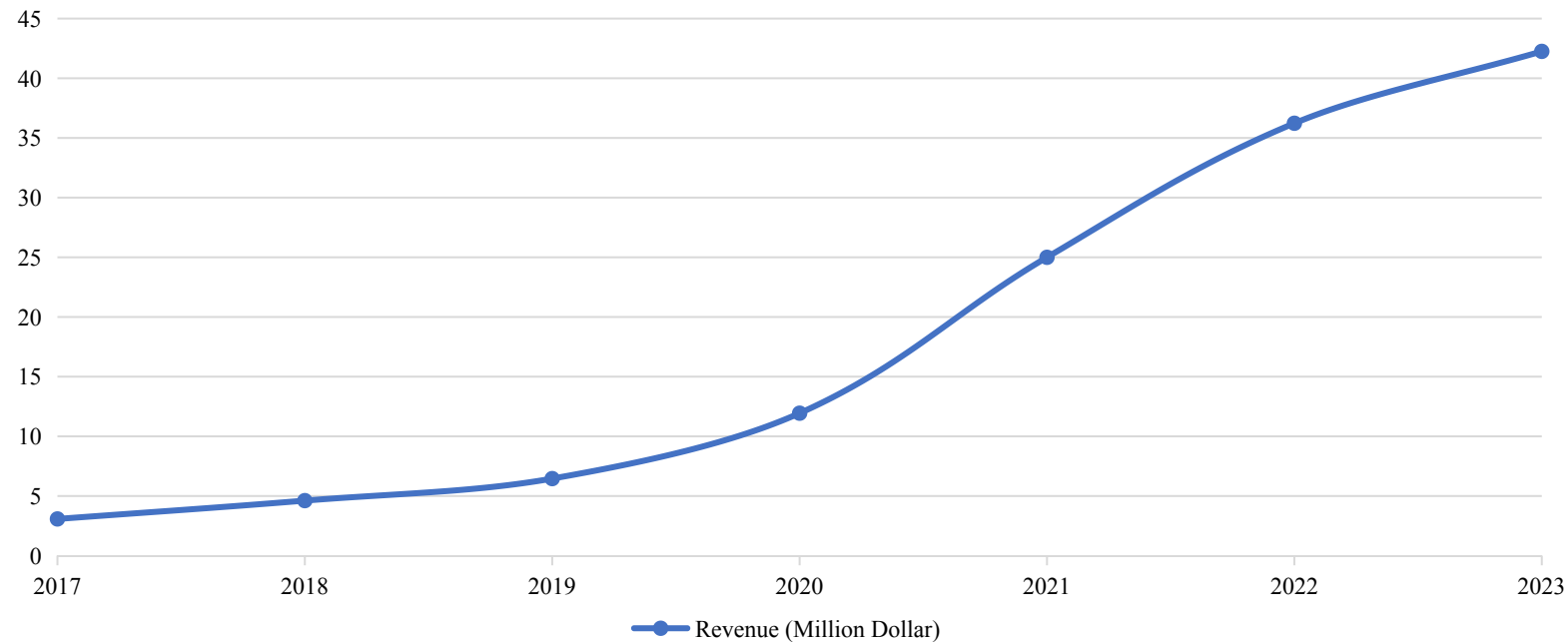
5 years of
performance growth

80%

Compound
Growth Rate

TOP 500

The choice of
world's top 500 companies



Complete After-sales Service System

MAKER-RAY

Maker-ray has been deeply involved in the industry for **more than ten years** and has established **more than 10 service** areas across the country and **20 service areas worldwide**. Its business scope covers **more than 200 cities** across China as well as many overseas regions including **Europe, America, Africa, and Southeast Asia**.











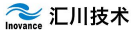


Marketed at Home and Abroad Used by Thousands of Factories

MAKER-RAY



MAKER-RAY Trusted by Them

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Home Appliance	 FOTILE 方太 回爱伟大	 Midea	 CHANGHONG 长虹	 Haier 海尔	 HMD [®] 广东华美达电器有限公司	 Panasonic 松下电器	 SKYWORTH 创维
Consumer Electronic	 SUNWODA 欣旺达	 MITAC	 RAMAXEL 亿芯	 HKC 惠科股份	 HEG 海格科技	 Simand 新安电器	 ASUS Rock Solid · Heart Touching
Security and Defense Communication	 FiberHome	 dahua TECHNOLOGY	 HIKVISION	 FLY	 Phenix 凤凰	 CTI 华测检测	 IPW
Power Supply	 林洋能源 LINYANG ENERGY	 Huntkey 航嘉	 MW MEAN WELL 明纬电源	 GOSUPER 高斯宝	 台达 DELTA Smarter. Greener. Together.	 EAGLE RISE 伊戈尔电气股份有限公司	 迈思普电子有限公司 MASS POWER ELECTRONIC LIMITED
Vehicle Electronics	 BYD 比亚迪汽车	 明世电子 www.mshdz.cn	 中国中车 CRRC	 上海电驱动	 MASS POWER	 Valeo 法雷奥	
Instrumentation	 精创股份 — Since 1996 —	 e 顿顿 EDON	 NARI 国电南瑞	 永泰隆 YTL	 中信华 ZHONGXINHUA	 许继集团	 Ceyear 思仪
Industrial Control	 洲钜科技	 Inovance 汇川技术	 axxon simple and smart	 ORIGIN	 SIEMENS	 yytek 云浦科技	
EMS	 伟创力集团 FLEXTRONICS	 安费诺 ANFEINUO	 LuXshare 立讯精密工业	 英业达 Inventec	 wistron 緯創資通	 深科技 KAIFA	...



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AI+AOI

Make Industrial Inspection Easier