QUICK team europe

Smart AOI

www.quick-global.eu

QUICK has over 10 years of experience in the development of machine vision equipment, with a wealth of technical expertise in areas such as visual algorithms, machine learning, deep learning, motion control, precision optical modules, and scalable software frameworks. Our products are used in SMT processes, inspection and measurement of semiconductor packaging fields such as substrates, wafer, die bonding and wire bonding. We also provide customized AOI modules and equipment for automated production lines.

Years of Experience

10+

AVL

Top Consumer Electronics Enterprise

SMT Innovation Product Award

SMT Innovation Technology Award

VA Vision Award

3D AOI Ensures High-Quality Inspection

Applications:

- SMT Pre/Post reflow inspection
- Pre/Post wave soldering inspection
- Electric vehicle on-board module inspection
- DBC/AMB substrate, die bond and wire bond inspection and measurement
- High-density FPC microvia inspection
- Smart wearable product module all sides inspection and measurement
- SMT component, dispensing and mylar all-in-one inspection

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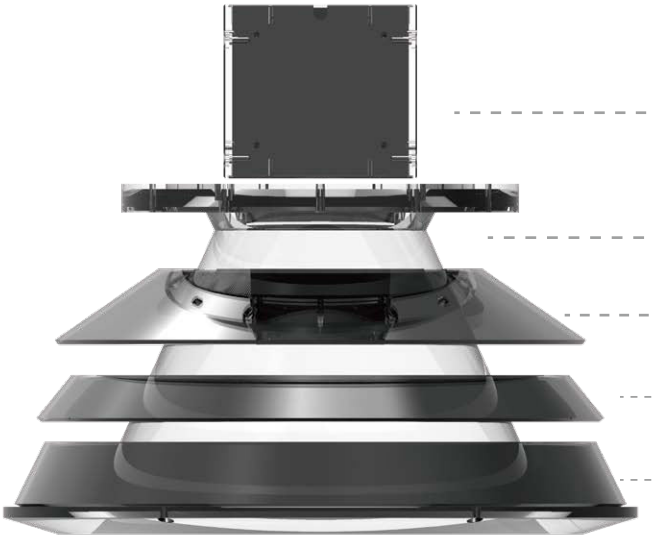
QUICK AOI Core Technology

Core Technology

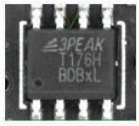
01

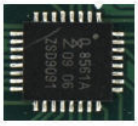
Advantages of 5-layer 8-channel light



Advantages:

- ✓ Illuminating from multiple angles
  Achieve different lighting effects at high, medium, and low angles.
- ✓ Highlighting defect characteristics with 12 channel images.
  Traditional RGB light yield only 3 channel images.

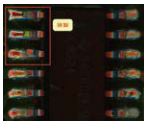

Light Component


Dark Component


Reflective Component


Damaged Component

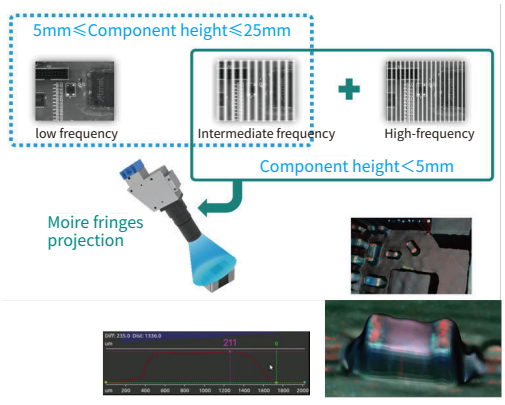

Scratch

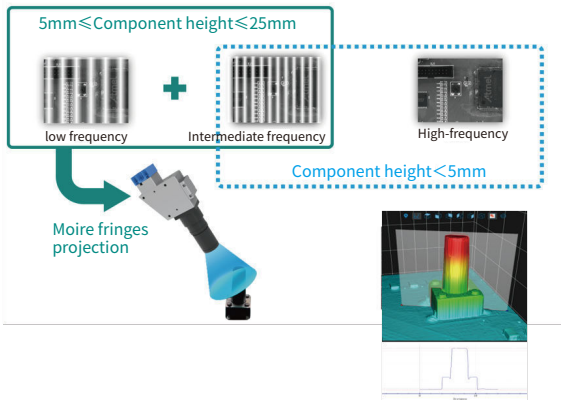

Lifted Lead


Shift

02

Multi-frequency Moire Fringes Technique



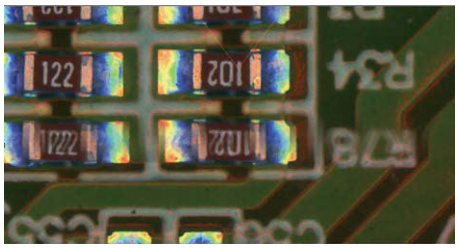


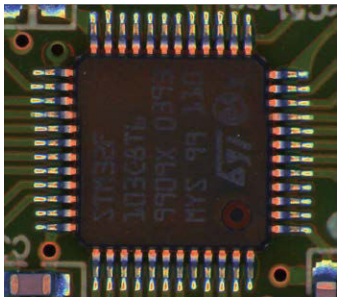
- ✓ The top camera captures multi-angle variable-frequency moire patterns, calculates phase differences, and extrapolates the object's height profile.

/// Core Technology

High Speed On-the-fly Image Capturing Technology& Seamless Image Stitching Technology

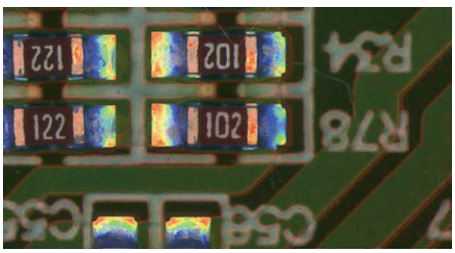
03

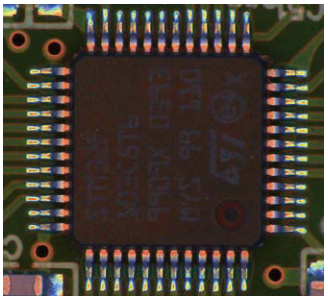




Traditional Stitching Technology

Seamless Stitching Technology

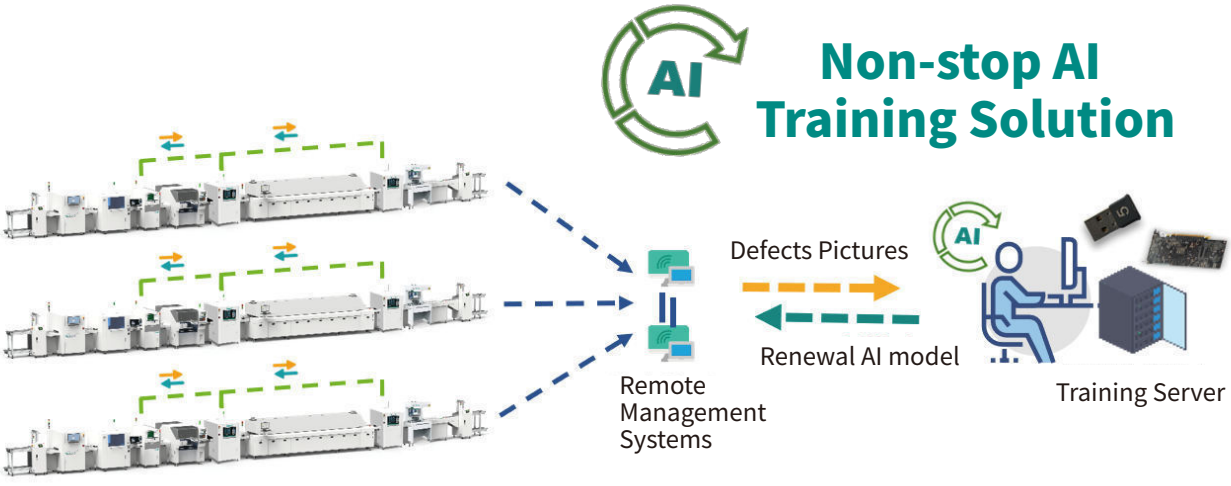




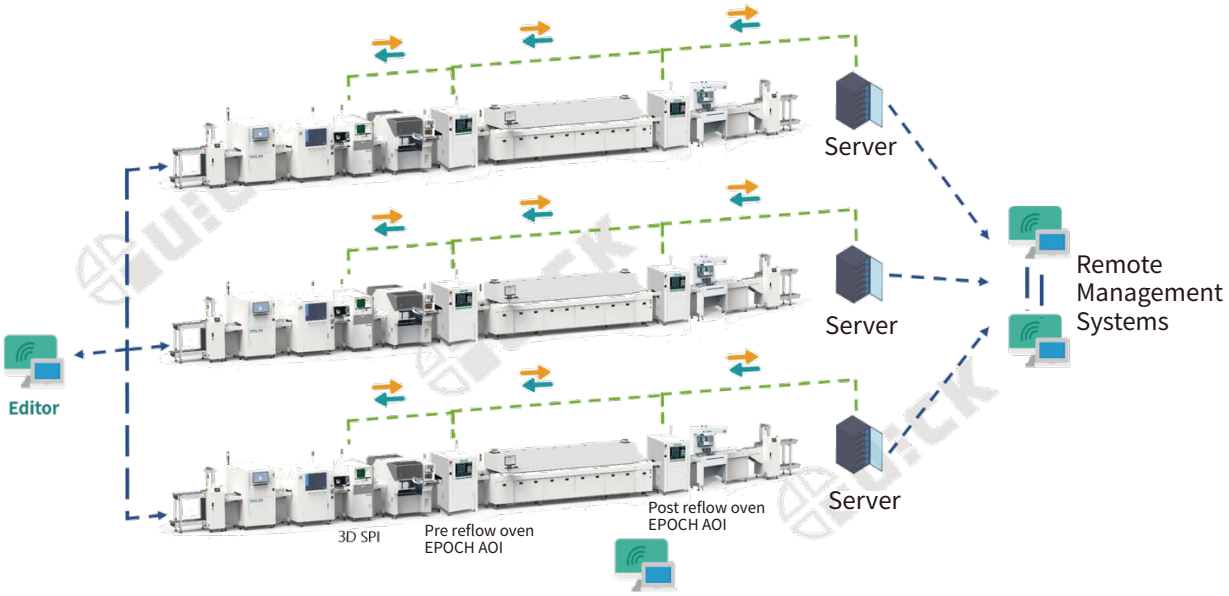
- ✓ On-the-fly image capturing speed can be as high as 430 mm/s (@ 15um)
- ✓ One click switching between on-the-fly image capturing and stop&go image capturing.
- ✓ Eliminate image distortion

Non-stop AI Training Solution

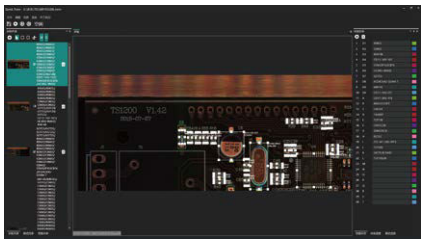
04



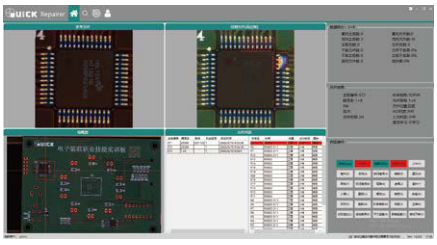
Software Total Solutions



Our software ecosystem offers a comprehensive smart factory solution, empowering our users to achieve higher production efficiency and quality improvement.

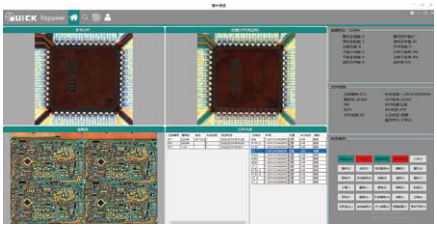


AI training software



Repairing station software

SPC software



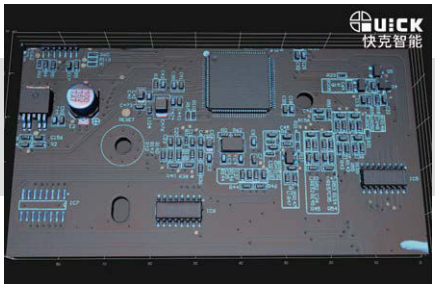
Remote management systems

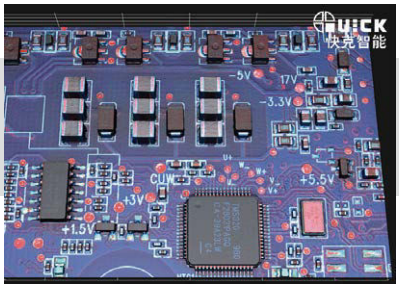
/// Core Technology

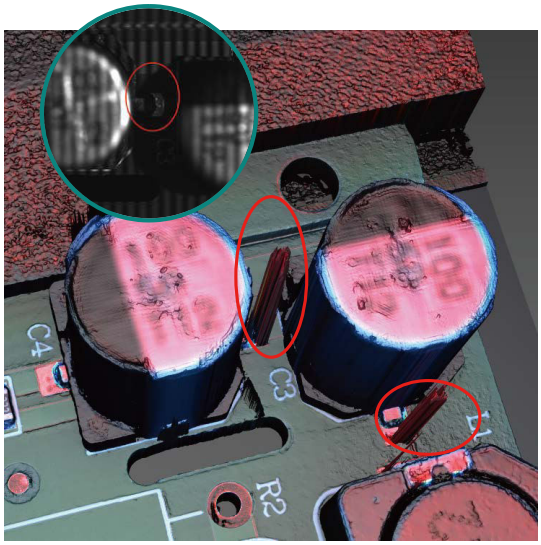
06

High-quality Imaging

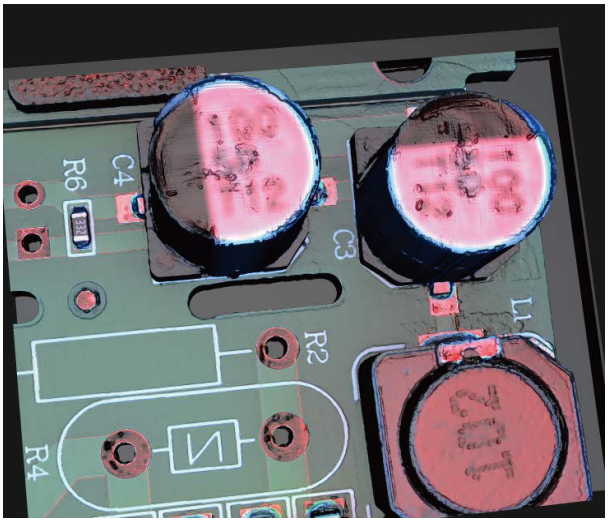
Strong algorithm compatibility, robust to different PCB colors



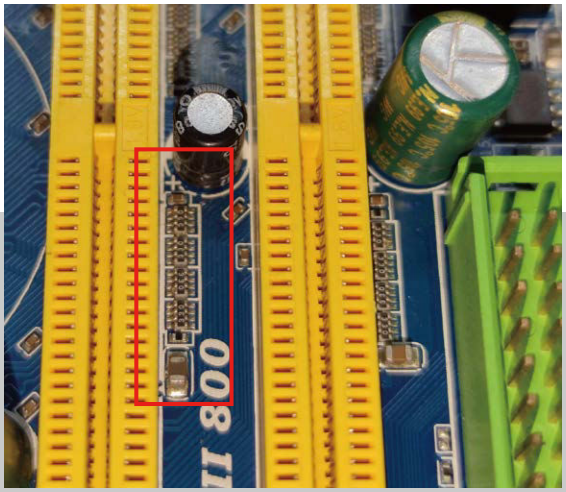


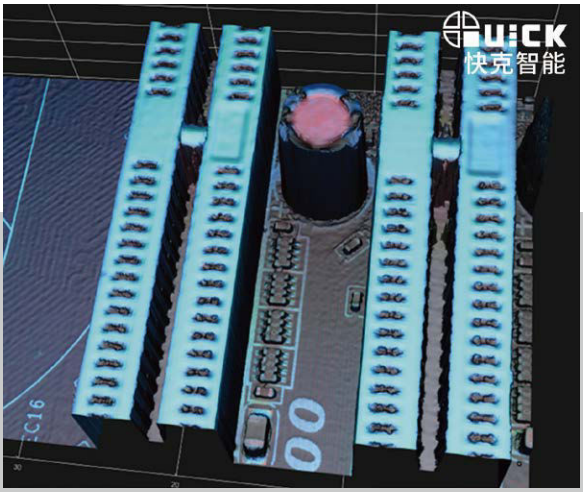


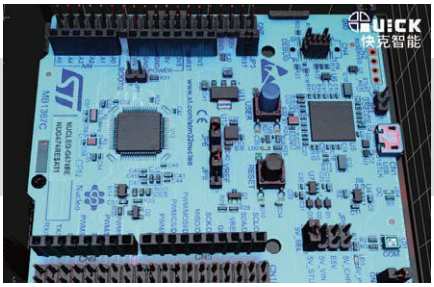
Multi-reflection suppression algorithm, removing noise caused by multi-reflection

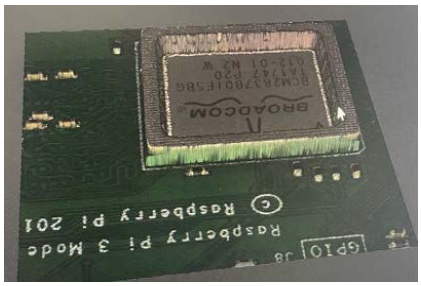


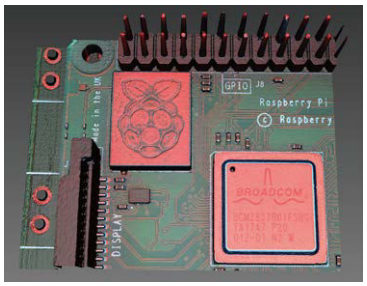
Multiple high-angle projectors, reducing shadow occlusion





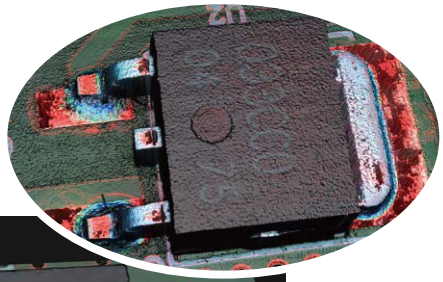


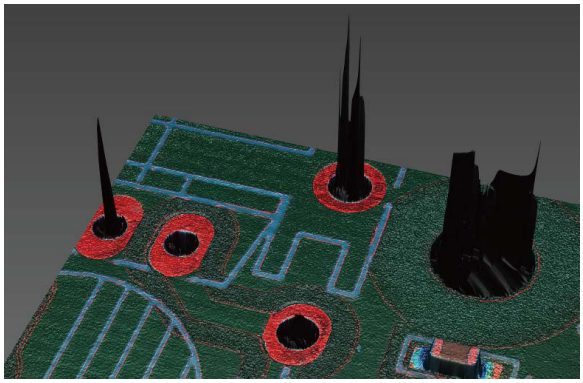


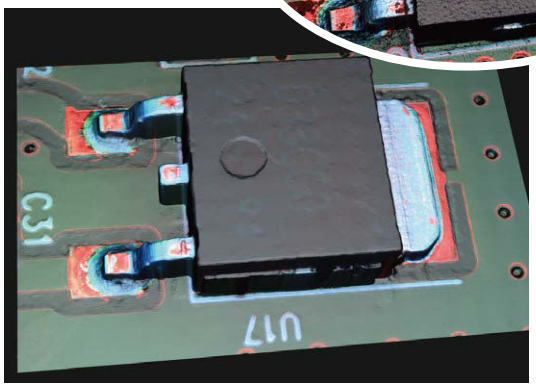


HDR technology, achieving good 3D reconstruction result for components with a variety of reflectivity levels

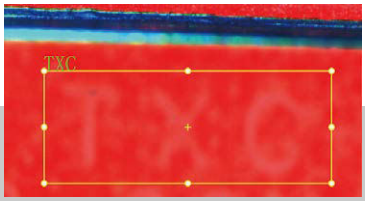
Intelligent fusion of multiple projection data eliminates holes and exposure interference

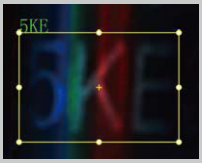


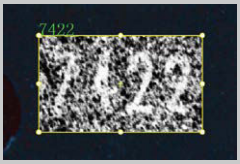




Our AI based OCR algorithm eliminates the need for cumbersome image preprocessing, offering significantly higher accuracy and stability compared to traditional OCR methods. It can effectively recognize characters with blurriness, dirt, uneven illuminating, low contrast, and other challenging conditions.

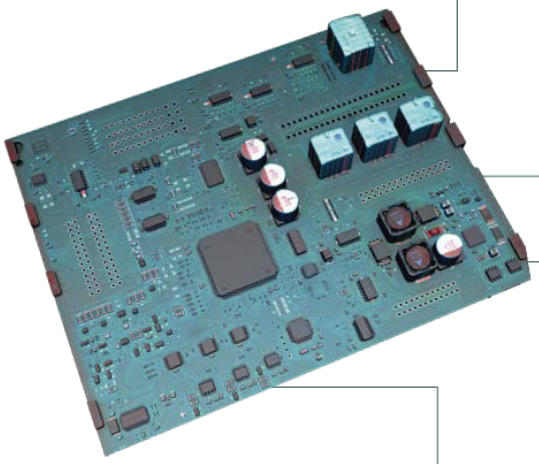






QUICK 3D AOI

3D AOI for Ensuring High-quality Inspection



Poor 3D reconstruction result for tall components

Significant variations in component reflectivity

High component density causing shadow occlusion

Multiple reflections causing interference in 3D reconstruction result

Technical Advantages

- Tri-frequency moire fringe technology achieving both measurement accuracy and maximum range.
- HDR technology enables good 3D reconstruction result for components with a variety of reflectivity levels.
- Multiple high-angle projectors, reducing shadow occlusion.
- Intelligent data fusion algorithm efficiently extracts valid data, eliminates noise and suppresses multiple reflection interference.

/// QUICK 3D AOI A300T

Technical Features

- High-speed and high-accuracy, linear motor platform.
- Advanced 3D reconstruction algorithm, reconstruct realistic 3D information.
- 4/8 high-angle projection, effectively reduce shadow effect.
- Perfect combination of 2D and 3D algorithms.
- Adaptive color algorithm, robust to different PCB colors.
- The multi-positioning and dynamic height reference algorithm eliminate the impact of board warping.

Specifications

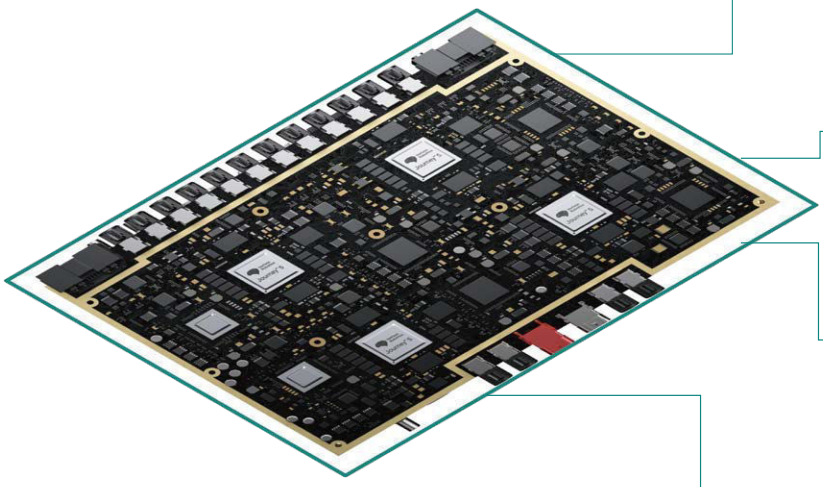
EPOCH A300T / A300T-D		
Use Case		Pre/Post SMT reflow oven inspection
Optical imaging system	Camera	12MP high-speed camera
	Light source	Multi-angle RGBW light source, four diection projection
	Optical resolution	10 μm/15 μm
	Inspection speed	450ms/FOV
Programming mode		Manual programming, CAD data import, AI programming
Defect inspection	Component defect	Misalignment, missing, skew, tombstoning, inverted, overturned, wrong Components, component damaged, polarity
	Soldering joint defect	Solder projections, blow holes, solder ball, insufficient solder, excess solder, solder bridge, warped foot, gold finger pollution/scratch
X-Y axis control system		Linear motor drive
X-Y axis positioning accuracy		5 μm
PCB carrier size		50×50mm(Min)～510×500mm(Max)
PCB curvature		＜5 mm
PCB measurable thickness		0.6-5 mm
PCB conveyor height		880-920 mm
PCB flow direction		Left in and right out, right in and left out (factory setting)
Conveyor loading weight		5 kg
Conveyor width adjustment/conveying		Automatic width adjustment, belt conveying
Height limit of passable component	Top	45 mm
	Bottom	60 mm
Weight		900 kg
Dimension		1000×1500×1650mm
Power requirements		200-240 V, single phase，50/60 Hz，3 kVA
Air source		5-6 bar
Machine safety		Meet CE standards
Software		Offline programming software(standard), maintenance station(standard), SPC management system (optional) ,MES docking

QUICK Deep Learning AOI

SMT Pre/Post reflow inspection

AI	Traditional AOI
Whole-board inspection model reduces misjudgments caused by color differences and device diversity	Difficulty in achieving full board inspection and solving the CT issue High density assembly interferes detection results High false-call rates, significant amount of manual review

High Density&complex SMT Inspection



Whole inspection on 5G/HPC board

Whole board image traceability

IC device detection on the entire board

Solder balls/scratches/foreign materials inspection of whole board

High density device occlusion problem

Technical Advantages

- High speed on-the-fly image capturing and seamless image stitching technology
- AI algorithms improves the inspection coverage and yield

/// QUICK A200T

Technical Features

• Combine AI and traditional algorithms, significantly increase inspection coverage.
• Seamless image stitching technology, eliminates image distortion.
• Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
• Pure white light inspection technology acquires accurate color information.
• One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
• Effectively detect defects such as solder ball, multiple components and PCB scratches across the entire board based on AI algorithms.
• Support mixed production mode.

Specifications

EPOCH A200T/D series		
Use Case		Pre/Post SMT reflow oven inspection
Optical imaging system	Camera	5 MP/12MP high-speed camera
	Light source	Multi-angle high intensity light source
	Optical resolution	4.3μm/10μm/15μm/20μm
	Inspection speed	On-the-fly imaging speed 430mm/s（15μm)
Defect inspection	Component defect	Missing, tombstoning, billboard, polarity, rotation, misalignment, OCV, component damaged, reverse, tilt, foreign material, solder float
	Soldering joint defect	Solder projections, blow holes, solder ball,insufficient solder, excess solder, solder bridge, warped foot, gold finger,pollution/scratch, roundness
	Mini Led defect	multiple die、missing die、upside down、reversed、shift、billboard、die lifting、rotation、dead led、foreign material、internal shorting、misalignment,excess solder,solder shorting、cold soldering
X-Y axis control system		High-precision ball screw drive
X-Y axis positioning accuracy		10 μm
Min PCB carrier size		50×50 mm
Max PCB carrier size		A200T: 470×510 mm A200T-D:Single track510×620 mm, Dual track 510×330 mm
PCB measurable thickness		0.6-5 mm
PCB conveyor height		880-920 mm
Conveyor loading weight		5 kg
Conveyor width adjustment/conveying		Automatic width adjustment, belt conveying
Height limit of passable component	Top	A200T/T-D：28-50 mm
	Bottom	A200T/T-D：60 mm
Weight		About 750 kg/-D model about 900 kg
Dimension		1000×1350×1650 mm
Power requirements		200-240 V, single phase, 50/60 Hz, 3 kVA
Air source		5-6 bar
Software		Offline programming software(standard), maintenance station&SPC management system (optional),deep learning software (optional)

/// QUICK A200CZ

Technical Features

• Combine AI and traditional algorithms, significantly increase inspection coverage.
• Seamless image stitching technology, eliminates image distortion.
• Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
• One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
• AI algorithm capable of inspecting whole board solder bead, extra or damaged component, and PCB scratches.

Specifications

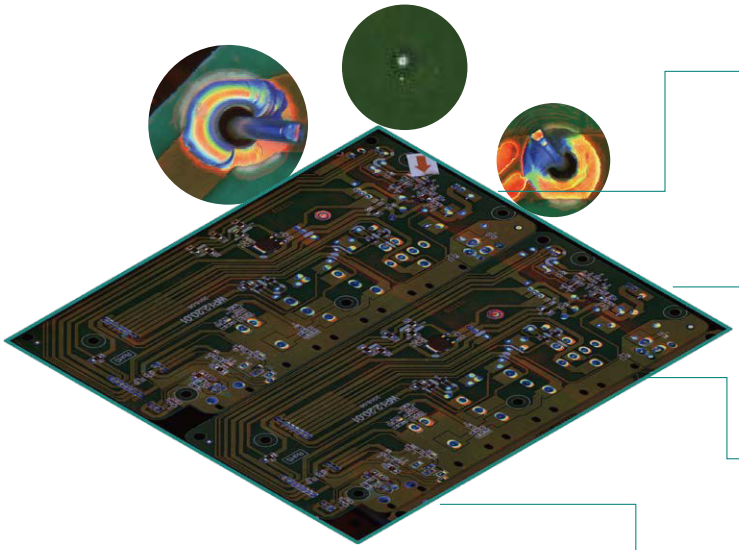
EPOCH A200CZ		
Use Case		Pre/Post SMT reflow oven inspection
Optical imaging system	Camera	5 MP/12MP high-speed camera
	Light source	Multi-angle high intensity light source
	Optical resolution	15 μm
	Inspection speed	Scan speed of 430 mm/s
Programming mode		Manual programming, CAD data import, AI programming
Defect inspection	Component defect	Misalignment, missing, skew, tombstoning, inverted, overturned, wrong components, component damaged, polarity
	Soldering joint defect	Solder projections, blow holes, solder ball, insufficient solder, excess solder, solder bridge, warped foot, gold finger pollution/scratch
X-Y-Z axis control system		High-precision ball screw drive, Z axis range 100 mm
X-Y-Z axis positioning accuracy		10 μm
PCB carrier size		50×50mm(Min)～470×510mm(Max)
PCB curvature		＜5 mm
PCB measurable thickness		0.6-5 mm
Max component measurable height		35 mm
Conveyor loading weight		13 kg
Conveyor width adjustment		Manual
Height limit of passable component	Top	28-50 mm optional
	Bottom	80 mm
Weight		About 500 kg
Dimension		1000×1350×1400 mm
Power requirements		200-240 V, single phase, 50/60 Hz,
Air source		5-6 bar
Machine safety		Meet CE standards
Software		Offline programming software(standard), maintenance station&SPC management system (optional),deep learning software (optional),barcode system (optional)

QUICK Deep Learning AOI

Pre/Post wave soldering inspection

AI	Traditional AOI
Whole board inspection AI model	Difficult to inspect whole board, long cycle time
Solder joint AI models	Tedious programming
AI auto programming	Difficult to inspect irregular solder joints

Complex and Irregular Solder Joints Inspection



Whole inspection on household electrical appliances board

Difficult to inspect bent lead solder joints

Wide variety of solder pad shapes: circular, elliptical, plum blossom, etc.

Large number of through-hole components and solder joints

Other inspection challenges: blowholes, solder spikes, voids

Technical Advantages

- High speed on-the-fly image capturing and seamless image stitching technology
- AI algorithms reduces false call rate and increases throughput

/// QUICK A103TZ

Technical Features

- Combine AI and traditional algorithms, significantly increase inspection coverage.
- Seamless image stitching technology, eliminates image distortion.
- Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
- Ultra depth of field image synthesis technique, capture crystal clear images of the entire board.
- One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
- Z axis compatible with products of varying heights.
- Heavy duty conveyor, capable of handling loads up to 25 kilograms.

Specifications

EPOCH A103TZ		
Use Case		Pre-reflow, Post-reflow
Optical imaging system	Camera	5 MP/12MP high-speed camera
	Light source	Multi-angle high white light
	Optical resolution	17μm
	Inspection speed	Scan speed of 430mm/S
Programming mode		Manual programming, CAD data import, AI programming
Defect inspection	Component defect	Missing, skew, wrong components, extra part , polarity
	Soldering joint defect	Solder projections, blow holes, solder ball, insufficient solder, excess solder, solder bridge, warped foot, gold finger pollution/scratch
X-Y-Z axis control system		High-precision ball screw drive, Z axis range 100mm
X-Y-Z axis positioning accuracy		10 μm
PCB carrier size		50×50mm(Min)～510×510mm(Max)
PCB curvature		＜5mm
PCB measurable thickness		0.6-5 mm
PCB conveyor height		880-920 mm
PCB flow direction		Left in and right out, right in and left out (factory setting)
Conveyor loading weight		20 kg
Conveyor width adjustment/conveying		Automatic Adjustment, Chain
Height limit of passable component	Top	110mm
	Bottom	45 mm
	Clamping Edge	3 mm
Weight		About 900kg
Dimension		1000*1350*1650mm
Power requirements		200-240 V, single phase, 50/60 Hz, 3 kVA
Air source		5-6 bar
Machine safety		Meet CE standards
Software		Offline programming software(standard), maintenance station software(standard), SPC management system (optional),deep learning software(standard),barcode system (optional)

/// QUICK A200 series

Technical Features

- Combine AI and traditional algorithms, significantly increase inspection coverage.
- Seamless image stitching technology, eliminates image distortion.
- Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
- One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
- AI algorithms can effectively detect defects such as solder ball, multiple components and PCB scratches across the entire board.
- Top and bottom camera asynchronous on-the-fly image capturing, avoid lighting interference.
- Optional roller conveyor, resistant to high temperatures, dirt, and with greater load capacity, meeting the requirements of wave soldering processes.

Specifications

EPOCH A200 / A200B / A200B-L			
Use Case		Post wave soldering, pre/post selective soldering, and wave soldering final inspection process	
Optical imaging system	Camera	5 MP/12MP high-speed camera	
	Light source	Multi-angle high white light	
	Optical resolution	10 μm / 15 μm / 20 μm	
	Inspection speed	Scan speed of 320/430/570 mm/s	
Programming mode		Manual programming, CAD data import, AI programming	
Defect inspection	Component defect	Misalignment, missing, skew, tombstoning, inverted, overturned, wrong components, component damaged, polarity	
	Soldering joint defect	Solder projections, blow holes, solder ball, insufficient solder, excess solder, solder bridge, warped foot, gold finger pollution/scratch	
X-Y-Z axis control system		High-precision ball screw drive	
X-Y-Z axis positioning accuracy		10 μm	
PCB carrier size		50×50mm(Min)~470×510mm(Max)	50×50mm(Min)~610×680mm(Max)
PCB curvature		＜5 mm	
PCB measurable thickness		0.6-5 mm	
PCB conveyor height		880-920 mm	
PCB flow direction		Left in and right out, right in and left out (factory setting)	
Conveyor loading weight		20 kg	
Conveyor width adjustment/conveying		Automatic Adjustment, Chain/Rollers	
Height limit of passable component	Top	80 mm	200 mm
	Bottom	35 mm	35 mm
Weight		About 900 kg	
Dimension		1000×1350×1650 mm	
Power requirements		200-240 V, single phase, 50/60 Hz, 3 kVA	
Air source		5-6 bar	
Machine safety		Meet CE standards	
Software		Offline programming software(standard), maintenance station&SPC management system (optional),deep learning software (optional),barcode system (optional)	

/// QUICK A201

Technical Features

- Combine AI and traditional algorithms, significantly increase inspection coverage.
- Seamless image stitching technology, eliminates image distortion.
- Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
- Pure white light inspection technology acquire accurate color information.
- One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
- AI algorithms can effectively detect defects such as bubble, excess glue and contamination.
- Heavy duty conveyor, capable of handling loads up to 25 kilograms.
- Automactically identify coating area and generating inspection windows.
- Capable of measuring whole board flatness and coating thickness.

Specifications

EPOCH A201		
Use Case		Conformal Coating
Optical imaging system	Camera	5 MP high-speed camera
	Light source	Multi-angle high white light + UV light
	Optical resolution	15μm
	Inspection speed	Scan speed of 430mm/S
Programming mode		Manual programming, Dispensing Map , AI programming
Defect inspection	Component defect	Misalignment, missing, skew, tombstoning, inverted, overturned, wrong components, component damaged, polarity
	Glue Defect	No coating, Insufficient coating, Extra coating, Bubbles, Splashed, Orange peel, Pinholing, etc.
Conformal Coating Inspection Thickness		30-650um； Conformal Coating Inspection Accuracy ±2um
X-Y-Z axis control system		High-precision ball screw drive
X-Y-Z axis positioning accuracy		10 μm
PCB carrier size		50×50mm(Min)～510×510mm(Max)
PCB curvature		＜5mm
PCB measurable thickness		0.6-5 mm
PCB conveyor height		880-920 mm
PCB flow direction		Left in and right out, right in and left out (factory setting)
Conveyor loading weight		20 kg
Conveyor width adjustment/conveying		Automatic Adjustment, Chain
Height limit of passable component	Top	55 mm
	Bottom	60 mm
	Clamping Edge	3 mm
Weight		About 900 kg
Dimension		1000×1350×1650 mm
Power requirements		200-240 V, single phase, 50/60 Hz, 3 kVA
Air source		5-6 bar
Machine safety		Meet CE standards
Software		Offline programming software(standard), maintenance station software(standard), SPC management system (optional), deep learning software(standard), barcode system (optional)

/// QUICK AR230

Technical Features

- Multiple cursor guidance, high alignment accuracy.
- Support multiple work station mode, increase repair efficiency.
- Red or green light optional.
- Fume extractor and rework station optional.

Specifications

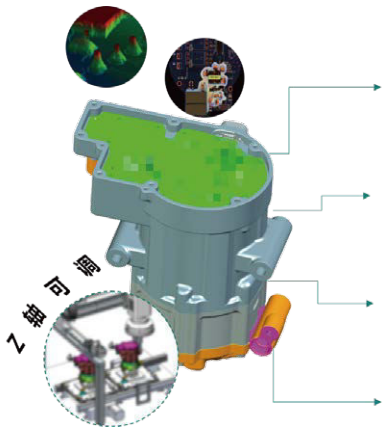
AR230	
Dimension	800×1650×950 mm
Appointed spot diameter	Adjustable
Appointed acurracy	±0.2 mm
Barcode reading	Support
Appointed range	50×50～400×350 mm
Appointed mode	Manual
Air source colour	Red/Green
OS	WIN10
Trigger mode	Auto
Conveyor height	900±20 mm
Fume extractor	Optional
Maintenance tool	QUICK TS1200
Communication	Standard SMEMA with Red/Yellow/Green indicators
General power	2 KW
Air source	0.4-0.6 Mpa

QUICK Deep Learning AOI

Electric vehicle on-board module inspection

AI	Traditional AOI
AI model	No Z Axis
Solder joint AI models	Difficult to trace data
AI auto programming	No quantitative data of solder joints

High Quality Solder Joint Requirements



- **Traceable whole board image**
- **Solder joint height, dimension and wetting angle**
- **Whole board lead ball/scratch/foreign material inspection**
- **Compatible with products of varying heights**

Technical Advantages

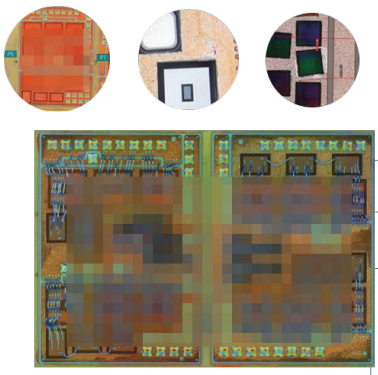
- Z axis, compatible with products of varying heights
- Quantitative analysis of solder joints by combining 2D and 3D data
- AI algorithms increase detection rate and throughput

QUICK Deep Learning AOI

DBC/AMB substrate, die bond and wire bond inspection and measurement

AI	Traditional AOI
AI model	No Z Axis
Solder joint AI models	Difficult to trace data
AI auto programming	No quantitative data of solder joints

DBC/AMB Die Bonding Inspection

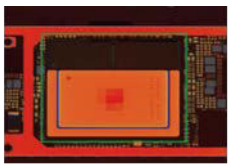


- DBC substrate warpage inspection
- Wire bond joints position and size inspection
- Scatch and crack inspection of high reflective components
- DBC substrate contamination inspection

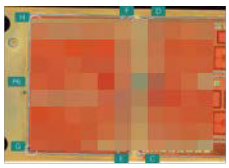
Technical Advantages

- High speed on-the-fly image capturing and seamless image stitching technology
- Inspect DBC/AMB warpage by combining 2D and 3D data
- AI algorithms increase detection rate and throughput

Die Bond



Underfill fillet



DBC Warpage

Wire Bond

/// QUICK A200TZ Series

Technical Features

- Z axis, compatible with products of varying heights
- Combine AI and traditional algorithms, significantly increase inspection coverage
- Seamless image stitching technology, eliminates image distortion.
- Multi-channel light sources that allows for the selection of the optimal light combination for different defects.
- One click switch among on-the-fly, partial on-the-fly and stop-and-go image capturing mode.
- Effectively detect defects such as solder ball, multiple components and PCB scratches across the entire board based on AI algorithms.
- Optional high-speed profiler to effectively obtain height information.
- Combining AI and traditional algorithms to address industry challenges such as a wide variety of defects, high defect complexity and numerous sources of interference.

Specifications

EPOCH A200TZ / EPOCH A203TZ		
Use Case		Detection requirements of height, shape, warping, coplanar, size etc
Optical imaging system	Camera	5 MP/12MP high-speed camera
	Light source	Multi-angle high white light
	Optical resolution	10 μm / 15 μm / 20 μm
	Inspection speed	2D on-the-fly imaging speed of 320/430/570 mm/s; 3D scan speed of 300 mm/s
Programming mode		Manual programming, CAD data import, AI programming
Defect inspection		Misalignment,missing,skew,tombstoning,inverted,overturned,wrong components,component damaged,polarity,solder projections,blow holes,PIN collinearity, Die position, height and volume, DBC warpage
X-Y-Z axis control system		High-precision ball screw drive, Z axis range 100mm
X-Y-Z axis positioning accuracy		10 μm
PCB carrier size		50×50mm(Min)～470×510mm(Max)
PCB curvature		＜5 mm
PCB conveyor height		880-920 mm
PCB flow direction		Left in and right out, right in and left out (factory setting)
Conveyor loading weight		5 kg
Conveyor width adjustment/conveying		Automatic width adjustment, belt conveying
Height limit of passable component	Top	80 mm
	Bottom	60 mm
Weight		About 750 kg
Dimension		1000×1350×1650 mm
Power requirements		200-240 V, single phase, 50/60 Hz, 3 kVA
Air source		5-6 bar
Machine safety		Meet CE standards
Software		Offline programming software(standard), maintenance station&SPC management system (optional),deep learning software (optional)

QUICK Deep Learning AOI

High-density FPC microvia inspection
Smart wearable product module all sides inspection and measurement
SMT component, dispensing and mylar all-in-one inspection

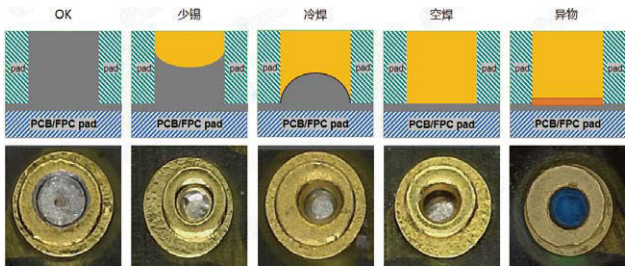
AI	Traditional AOI
Whole board inspection AI models	Difficult to inspect whole board, long cycle time
Solder joint AI models	Tedious programming
AI auto programming	Difficult to inspect irregular solder joints

Smart Wearable Product Inspection & Measurement

High-density complex FPC micro-hole inspection

SIP module all sides inspection

Mylar, component and dispensing inspection



Technical Advantages

- High speed on-the-fly image capturing and seamless image stitching technology
- Capture high definition images of mirco-hole solder joints using multi-angle microscopy cameras
- AI algorithms reduces false call rate and increases throughput

/// QUICK A200FPC

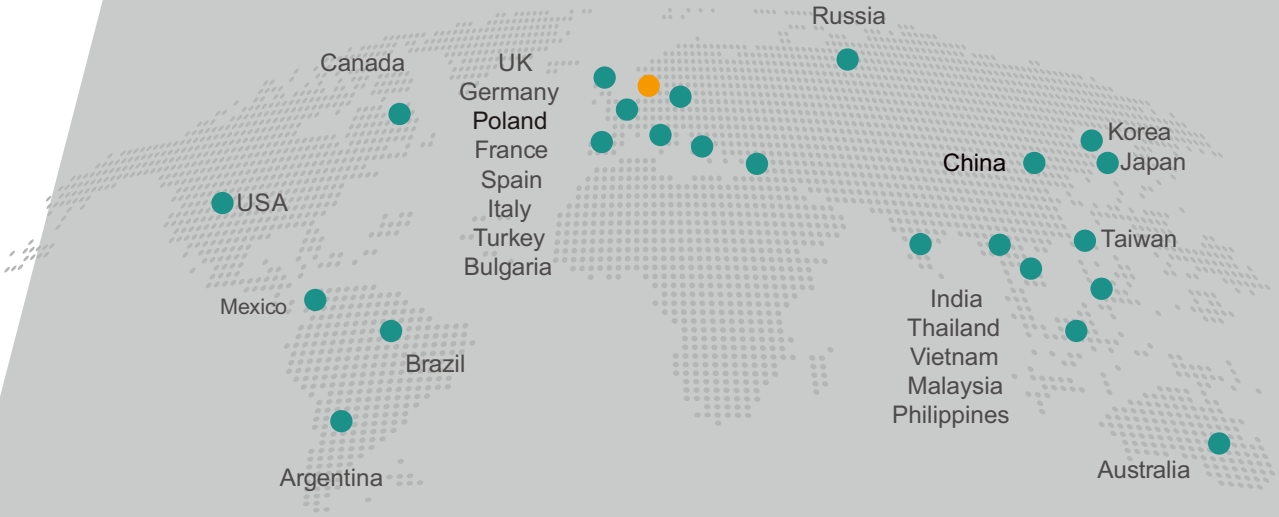
Technical Features

• Capable of inspecting defects in 0.15mm diameter micro-hole.
• Capture high definition stereoscopic images of mirco-hole using multi-angle microscopy cameras.
• Flexible software framework and workflow-based programming. Suitable for the inspection of various types of product.
• Combining AI and traditional algorithms to address industry challenges such as wide varity of defects, high defect complexity and numerous sources of interference.

Specifications

EPOCH A200FPC	
Camera	Microcamera
Light source	Ring shadowless
Optical resolution	1.33 μm
Misjudgment rate	＜0.5%
Mechanical reliability	CPK＞1.33
AOI GRR	＜10%
Weight	About 1200 kg
Dimension	1000×1500×1650mm
Power requirements	200-240 V, single phase, 50/60 Hz, 3 kVA
Air source	5-6 bar
Communication	Standard SMEMA

Global Services



QUICK INTELLIGENT EQUIPMENT

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