I.C.T AOI Solution

Contents

AOI Series

SMT	**Offline 2D**	
SMT	**Online 2D, Single&Dual Rail**	
DIP	**Online 2D, Before THT Soldering**	
DIP	**Online 2D, After THT Soldering, Single &Dual Side**	
Coating	**Online 2D, After&Before Oven, Single &Dual Side**	
Online Double side	**Online 2D, Dual Side, SMT&DIP**	
AOI Repair Station	**Online&Offline**	
Select appropriate solutions according to different products.		

AOI AI Core Technology

Applying deep learning algorithms in the field of industrial inspection, big data optimized, intelligent minimalist programming, one-click automatic identification of trained components and solder joints, intelligent judgment of bad.

Solving the two traditional algorithm pain points:

1. Long programming time.

2. High false alarm rate.
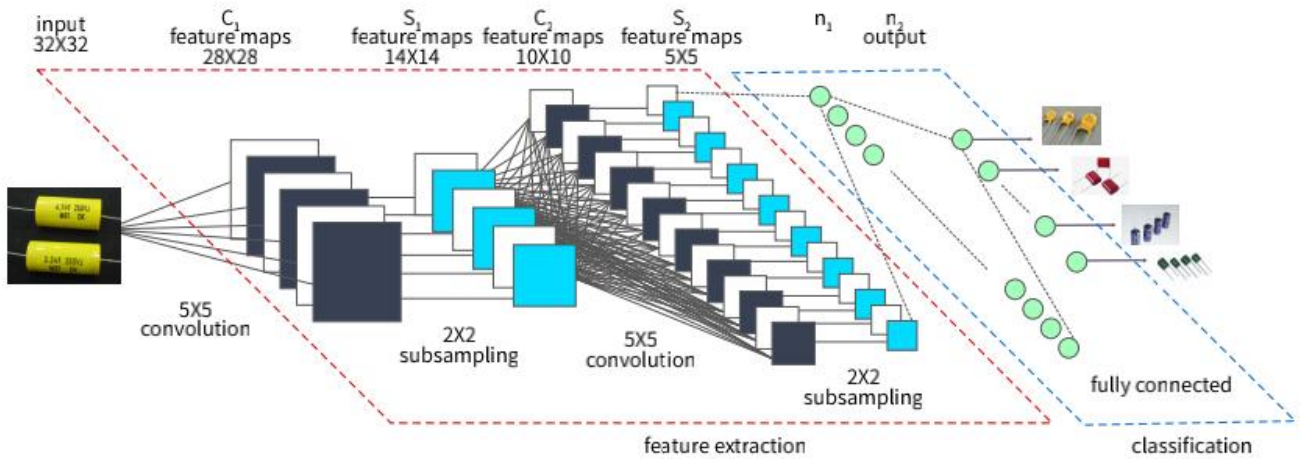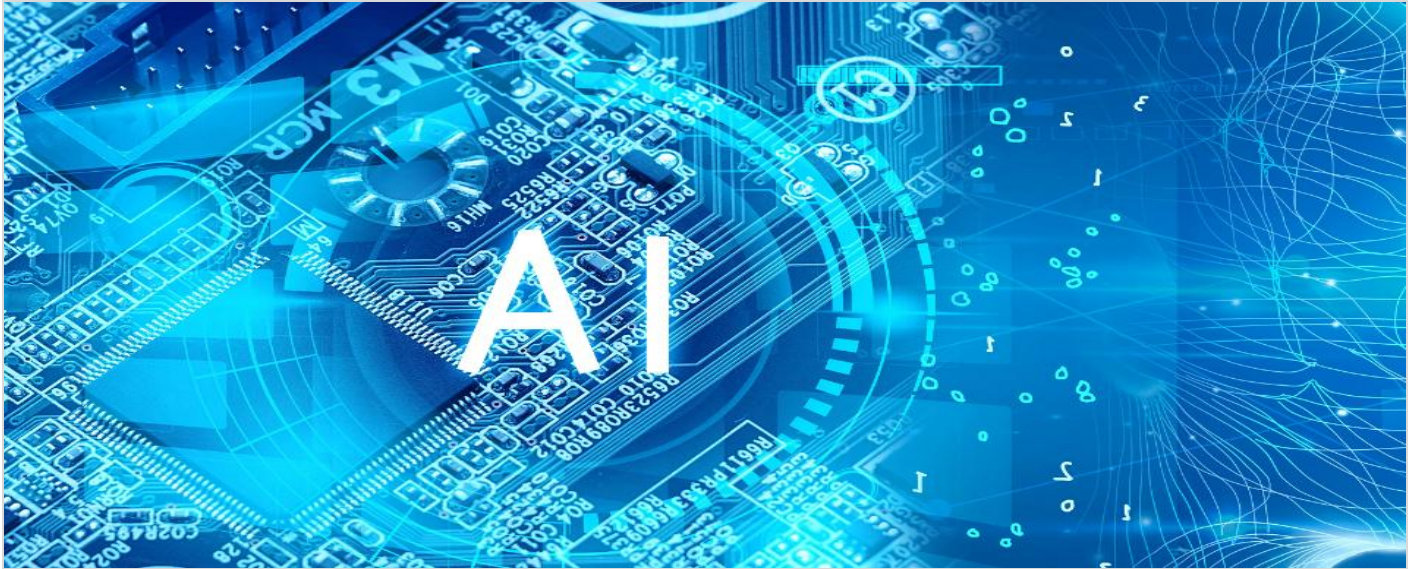
SMT Offline AOI Machine I.C.T-V8

Introduction:

For SMT pre-reflow, post-reflow inline inspection;

Granite platform, greatly improve machine precision and stability;

Programmable RGB+W LED lighting source;

Telecentric lens with constant magnification and low distortion response to high compone.

Features:

1. LOG automatic collecting and storage function, NG warning/alarm function, Remote programming&debugging.

2. Inspection ability: insufficient, short, soldering hole, solder covering pin, contamination, misalignment, missing part, skewed, billboard,

mounting on side, overturn, wrong part, damaged, float, polarity, pseudo soldering, empty solder, excessive glue etc.

3. Perfect SPC collects NG information off line and generates all kinds of production tables automatically.

4. Mature control center function, clear software interface.

5. Good stability(GR&R<10% @6 Sigma, CPK>1.33) Test deviation accuracy less than ±0.25mm.

6. Camera move, conveyor fixed during test.

7. PCB warpage compensation: total Mark compensation calibration, component position frame compensation.
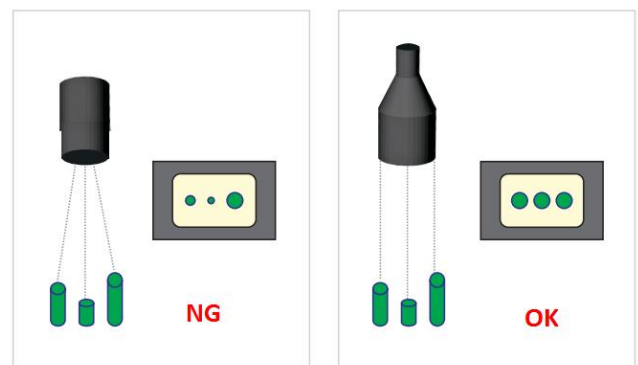
Advantage:

Granite Platform and Frame

Ensure the stability of the equipment and the

consistency of sharing program between machines.

Industrial camera+Telecentric lens

The high component solder joint inspection is not

affected as no shadow effect in the entire field of view.

Entire FOV Assist Position

High detection ability on no exposed pad

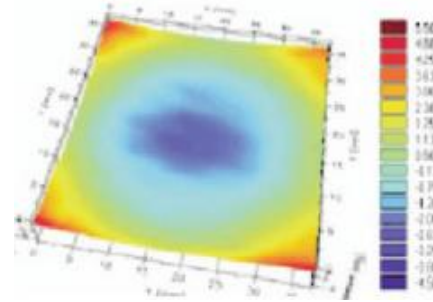components(BGA,etc.)or partially shielded components

▲ Before positioning   ▲ After positioning

PCB Warpage

Solder pad position able to reduce high false call due to

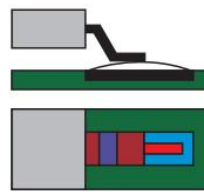deformation of PCB after reflow, especially for FPC
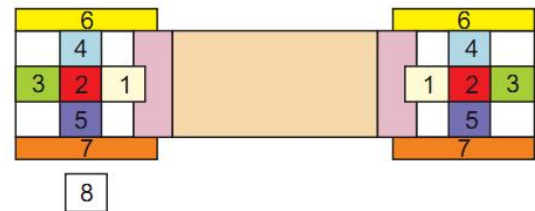

Poor Soldering Inspection

Based on precisely positioning on the solder pad, the features points of the entire solder pad will be analyzed. Therefore, the poor solder of chip or IC can be effectively detected.
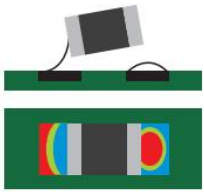
Chip no wettability   IC no wettability

The shape of no wettability

- Accurately positioning pad
- Analysis 8 feature points

Specification:

Model	I.C.T-V8	I.C.T-V8XL
FOV	36*30mm (15μm); 24*20mm (10μm)	
Camera	5M pixel intelligent digital industrial camera	
Lens	Telecentric lens	
Light	4 color ring LED light, RGB+W	
Inspection Item	Component test, soldering test	
Mini Component	0201 chip, 0.3mm pitch IC and Special shaped	
Operation System	Windows 10	
PCB Size	50*50~420*330mm	50*50~610*510mm
PCB Thickness	0.3~6.0mm	
PCB Warpage	±3.0mm	
PCB Weight	Max: 10Kg	
PCB Height	Top: 25-60mm, Bottom: 25-80mm adjustable	
X/Y Driver	AC servo driver	
Platform	Marble	

With Adjustment	Manual	
Power	AC220 50/60Hz,2.5A	
Communication	SMEMA	
Weight	500Kg	800Kg
Dimension	880*1170*1350mm(excluding the light)	1080*1470*1370mm(excluding the light)

Dimension(mm):
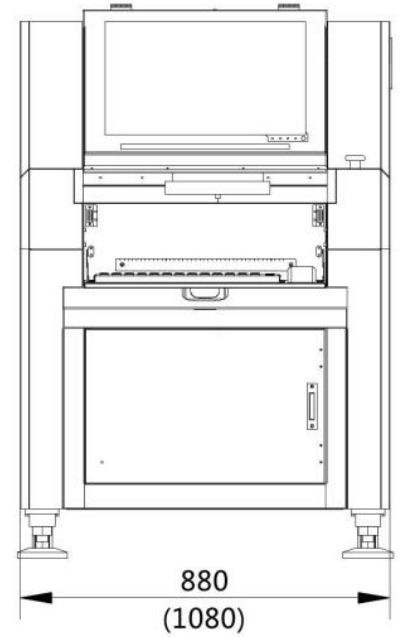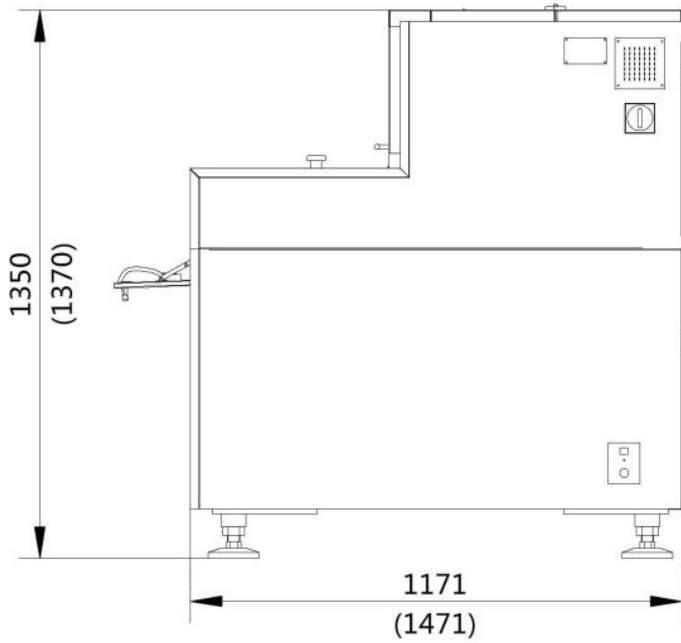
* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.
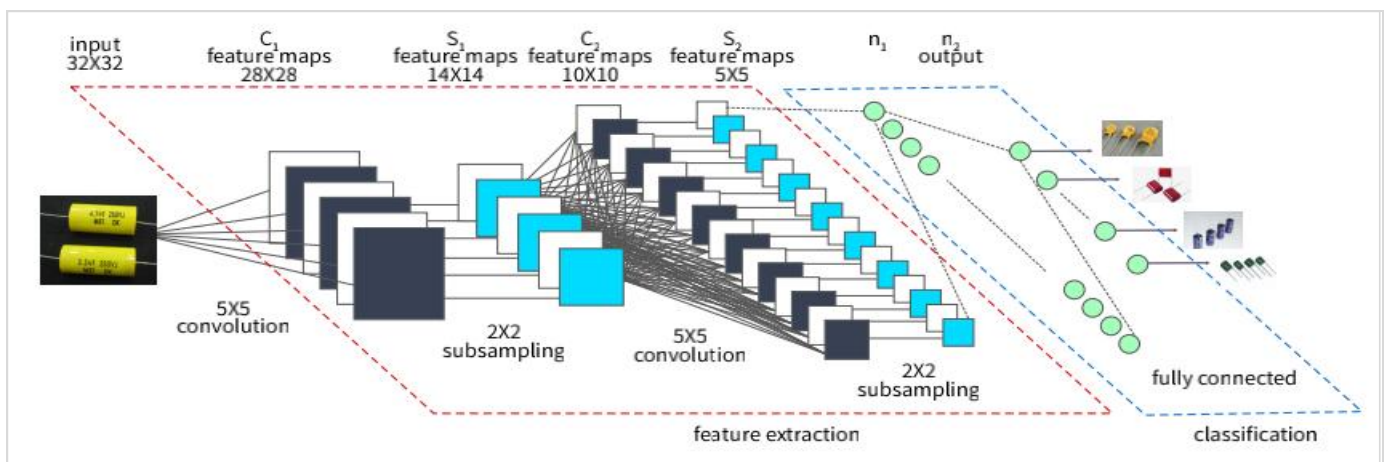
I.C.T SMT Online AOI AI-5146

I.C.T SMT AOI captures board image in real time by high precision color industrial camera. Adopt Convolution Neural Network (CNN) algorithm to process images. Judge components defects and soldering defects intelligently.

Features:

1. For SMT pre-reflow, post-reflow inline inspection.

2. High inspection rate and low false alarm rate.

3. Granite platform, greatly improve machine precision and stability.

4. Programmable RGB+W LED lighting source, Bilateral telecentric lens, low distortion and high depth of field.

5. Simplified programming flow, very simple interface. Support batch modifying parameters with one-key.

6. Centralized control. Interconnection between multiple equipment.

7. Multiple configurations meet different inspection demands.

8. Inspection ability: insufficient, short, soldering hole, solder covering pin, contamination, misalignment, missing part, skewed, billboard, mounting on side, overturn, wrong part, damaged, float, polarity, pseudo soldering, empty solder, excessive glue, etc.

9. Good stability(GR&R<10% @6 Sigma, CPK>1.33) Test deviation accuracy less than ±0.25mm.

10. PCB warpage compensation: total Mark compensation calibration, component position frame compensation.

11. Data is traceable. Support SPC alarm, LOG automatic collecting and storage function, NG warning/alarm function, Remote programming&debugging.

Advantage:


Deep Learning Algorithm

I.C.T AOI by applying deep learning algorithm, big data optimization and intelligent minimalist programming in industrial inspection, I.C.T enables intelligent judgment by one-click automatic identification of components and solder joints, thus addressing the two major pain points of traditional algorithms, namely, long programming time and high false alarm rate.
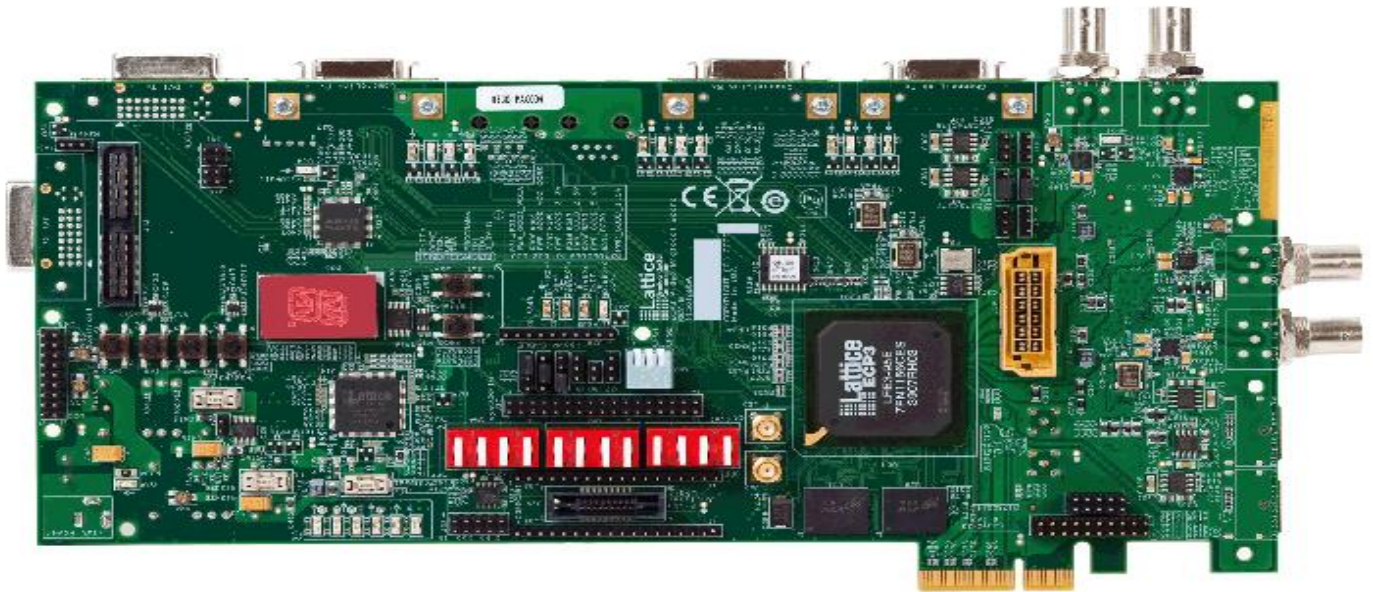
Flexible procedures

1. Intelligent judgment: Automatically check resistance, capacitance, diode and other components.

2. Offline programming: Support off-line programming. Convenient for modification and debugging.

3. Online programming: Optimize and adjust equipment parameters without stop of production line.

4. Quick changeover: Files of existing formats can be called directly without repeated adjustment.

5. Intuitively remind: SPC reminds item number, wrong device and its type with both pictures and characters.
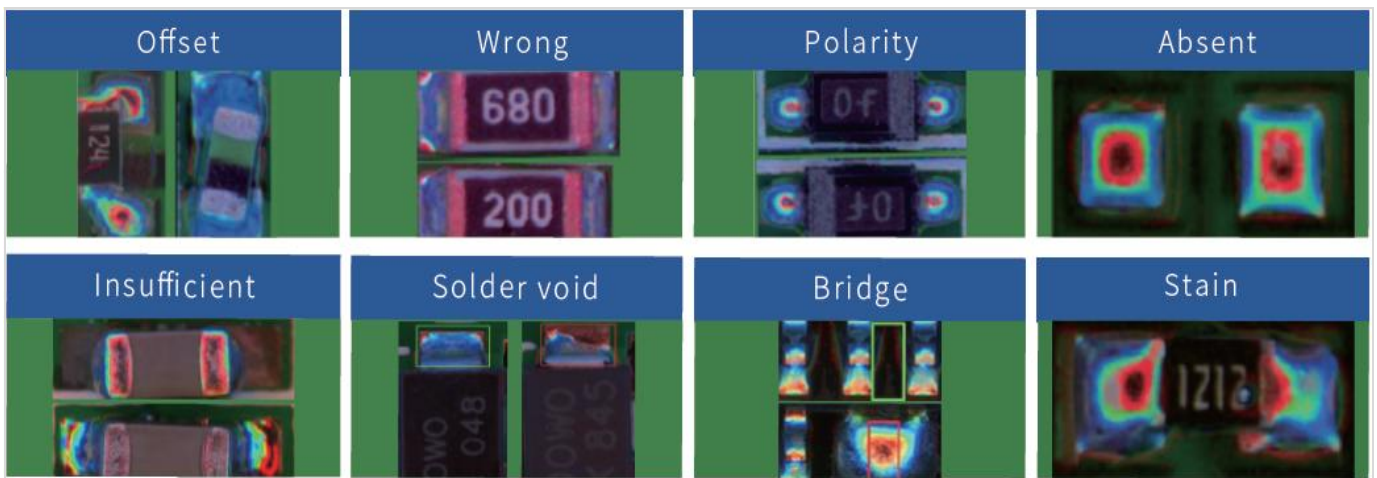
Strong Intelligent Inspection Capability

1. Model is trained based on big data. High identification accuracy of components and soldering tin.

2. Correct alarm caused by components overhang and soldering tin deviation. Reduce false alarm. For fuzzy feature, it has strong identification capability.

3. Effectively inspect defects without being interfered by color of board and change of characters on device

4. Irregular parts inspection is strong. Automatically generate IC pin inspection checkbox. Judge multiple defects with one checkbox.

5. Strong generalization ability. Device deviation, normal through high precision identification but slight overhang of itself, slight color difference, irregular arranged devices and other complicated situation are compatible. Thus, low false alarm rate can be realized.
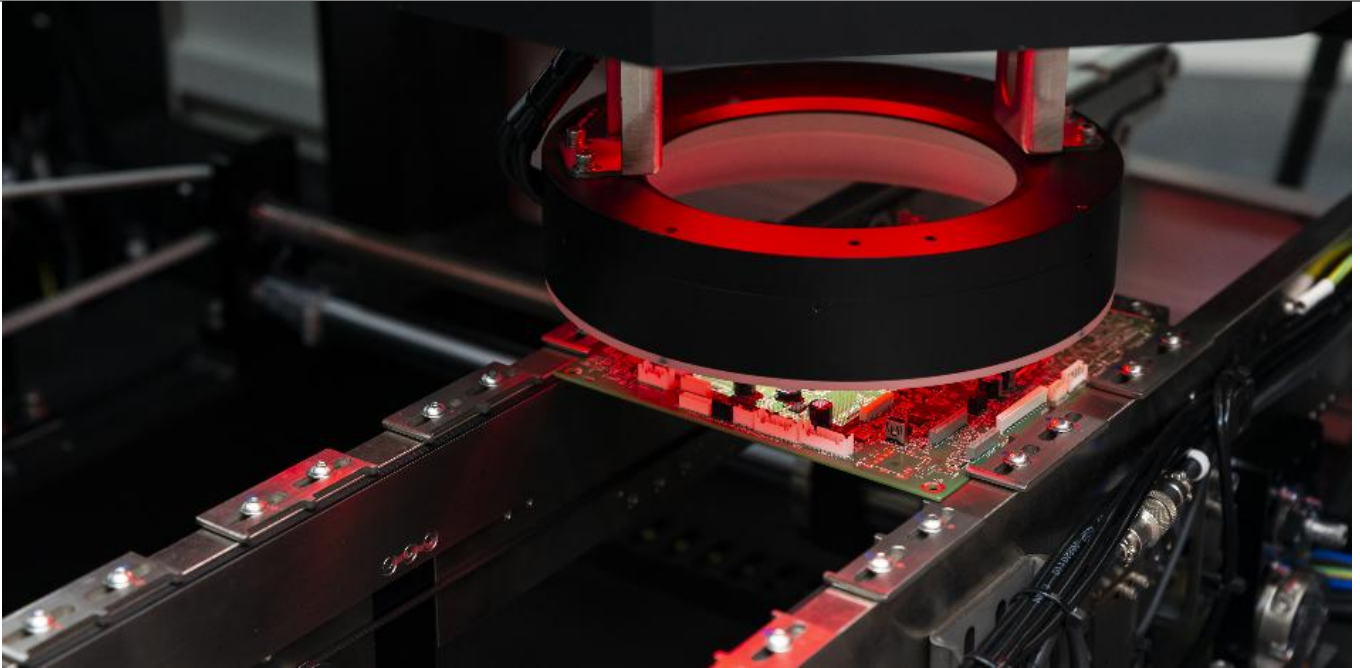
Quick Inspection Speed

1. Adopt photographing inspection mode of top high precision intelligent camera. Flexibly deal with high capacity PCB.

2. Adopt deep alignment control system and maintain ultrafast moving speed.

3. Real-time computation. Shoot next FOV. Meanwhile compute last FOV solder joint.

4. Path planning. Automatically plan path movement inspection.
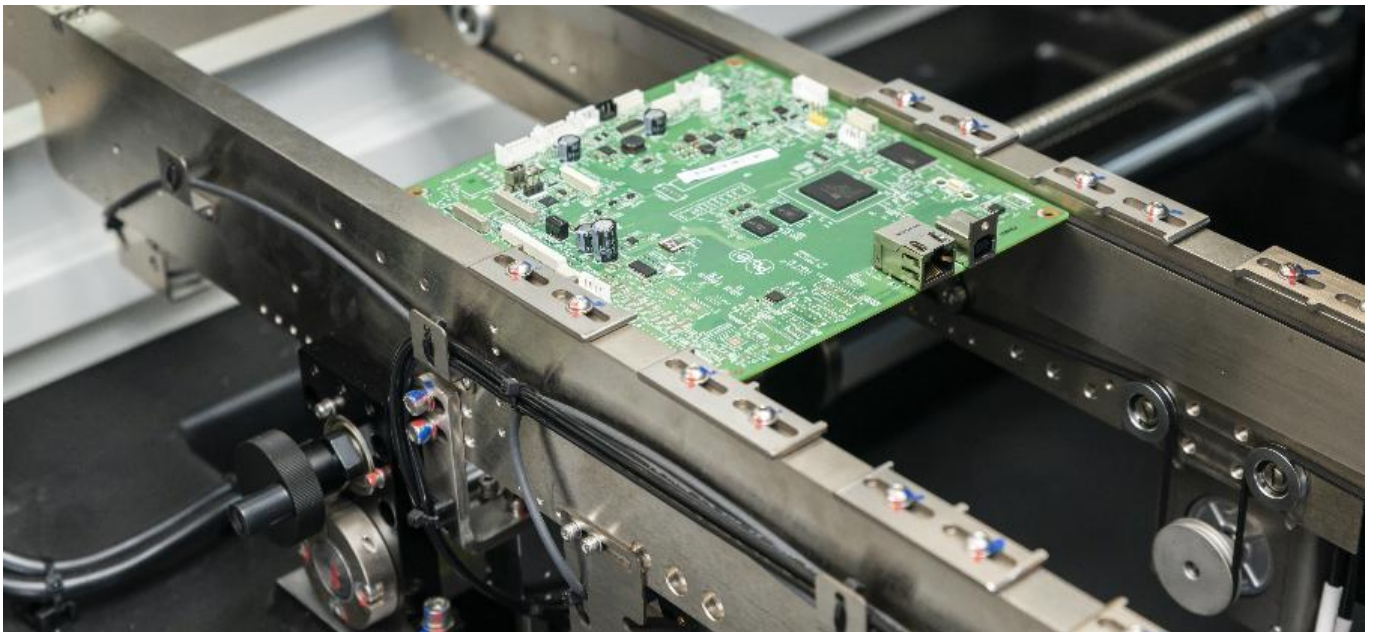
Multiple Inspection Modes

1. Multiple inspection modes can be designed by combining multiple production modes of factories.

2. Support multi-type machine production mode, substitute material mode and other modes.

3. Support joint-board inspection, Support mixed board inspection, Support mixed material inspection, Support multiple MARK(including Bad Mark function), Support automatic identification A/B program.

4. Multiple inspection scenarios. Support board inspection with/without fixtures.
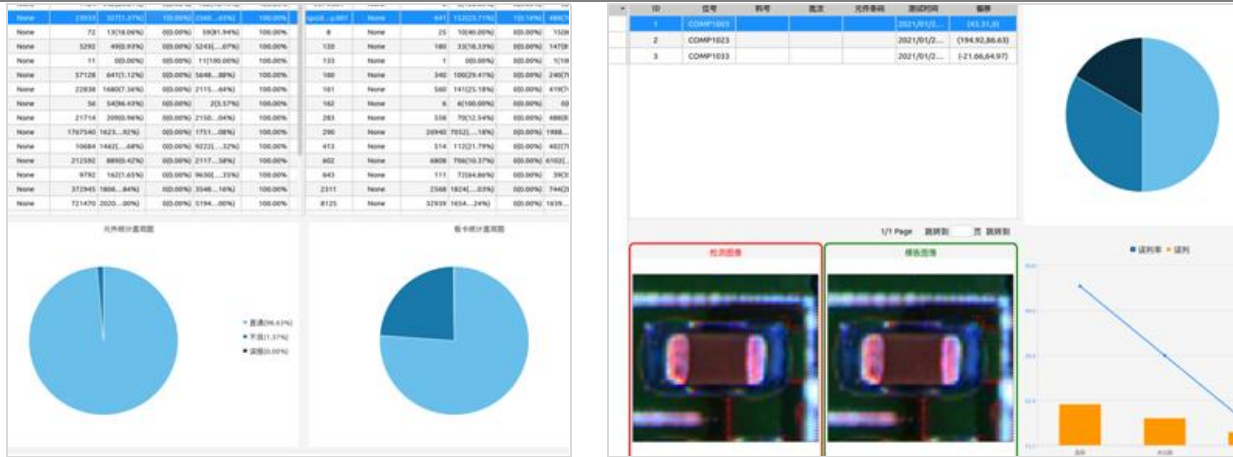
MES System Data Report

1. Data is retained in real time and can be exported, which is beneficial to process improvement and production tracing.

2. Camera automatically reads code (bar code and QR code).

3. Complete data, including overall statistic data and all inspection information of each board inspected.

4. Support one-key export, which is convenient for traceback. Data can be effectively applied in MES system.

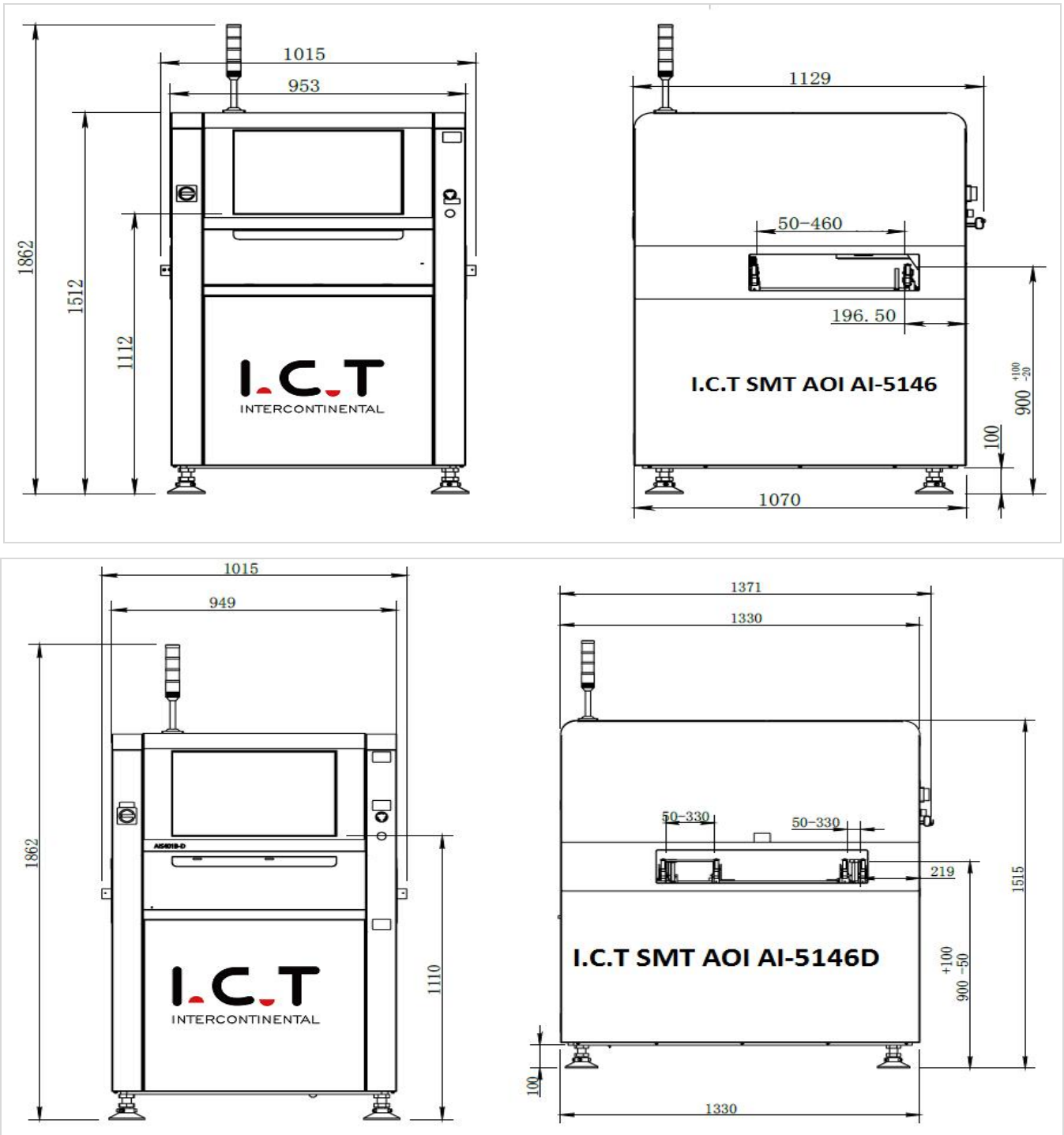**Centralized Management and flexible Service**

1. Support remote programming, debugging and management. Save changeover time. Support one-to-many judgment.

2. Remote regulation, centralized management. Reduce suspension of work. Enhance production efficiency.

3. Remote offline programming, which will not affected inspection.

4. Remote support. Quick response and maintenance.

5. Multi-judgment work station realizes one-to-many judgment.

Specification:

Model	I.C.T SMT AOI AI-5146	I.C.T SMT AOI AI-5146D
Mini Component	01005chip, 0.3pitch IC and Special shaped	
Resolution@FOV	10um@40*30mm	10um@40*30mm
Camera	12M pixel intelligent digital industrial camera	
Lens	Telecentric lens	
Light	RGB+W 4 color integral	

Inspection Speed	0.23sec/FOV	
Inspection Algorithm	CNN, Color contrast, Outline recognition, Offset inspection, Template matching, Character comparison, OCR ,etc.	
Inspection Item	Component: Absent, Reversed, Mis-alignment, Broken, Extra,Foreign matter,Stained, etc. Solder: Insufficient solder, excessive solder,bridging,pseudo solder etc. Other: Bar code Recognition / QR code Recognition / OCR.	
Mixing PCB inspection	Support calling program automatically.	
PCB Size	50*50mm~510*460mm (Large board mode: Left to right: max 730*460mm Right to left: max 640*460mm)	50*50mm~510*610mm (Single rail operation) 50*50mm~510*330mm (Dual rail operation)
Rail	Single rail	Dual rail
PCB Height	Top: 25mm, Bottom: 80mm	Top: 25mm, Bottom: 30mm
PCB Thickness	0.3~6.0mm	
PCB Edge	3.7mm	
PCB Warpage	±3.0mm	
PCB Weight	Max: 3Kg	
Conveyor Height	900±20mm	
With Adjustment	Manual / Auto	
Conveyor Direction	L~R or R~L	
Motion Driver	AC servo driver + Ballscrew, repeat accuracy 0.01mm	
Platform	Granite	
Operation System	Ubuntu 18.04 LTS 64bit Remote control, remote assistance, CAD file import and user-defined model training	
PC	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 32G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 64G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
Display	23.8 inch FHD display	
Data output	Autogenerated statistic analysis SPC	
Special function	Automatic search of elements and quick programming	
Power	AC220, 50/60Hz, 5A	
Rated power	380W	
Compressed Air	0.4~0.6Mpa	
Communication	SMEMA	
Weight	750Kg	790Kg
Dimension	L1015*W1086*H1539mm (excluding the light)	L1015*W1370*H1539mm (excluding the light)

Dimension:

I.C.T SMT AOI AI-5146

I.C.T SMT AOI AI-5146D

* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.

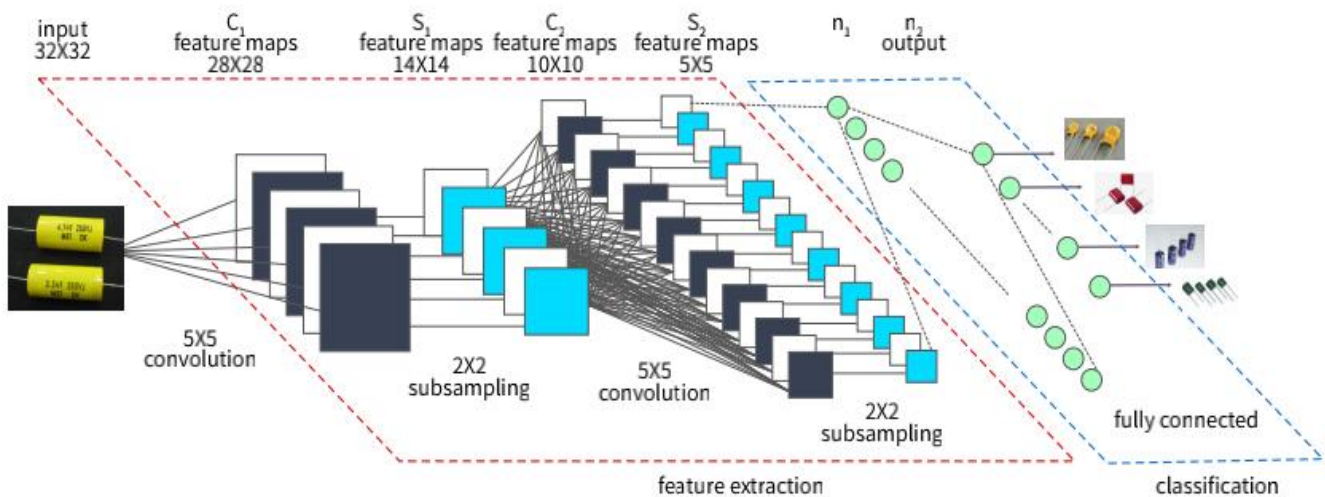**I.C.T DIP Online AOI AI-4026 (Before THT Soldering)**

I.C.T DIP AOI captures board image in real time by high precision color industrial camera. Adopt Convolution Neural Network (CNN) algorithm to process images. Judge defects of components intelligently.
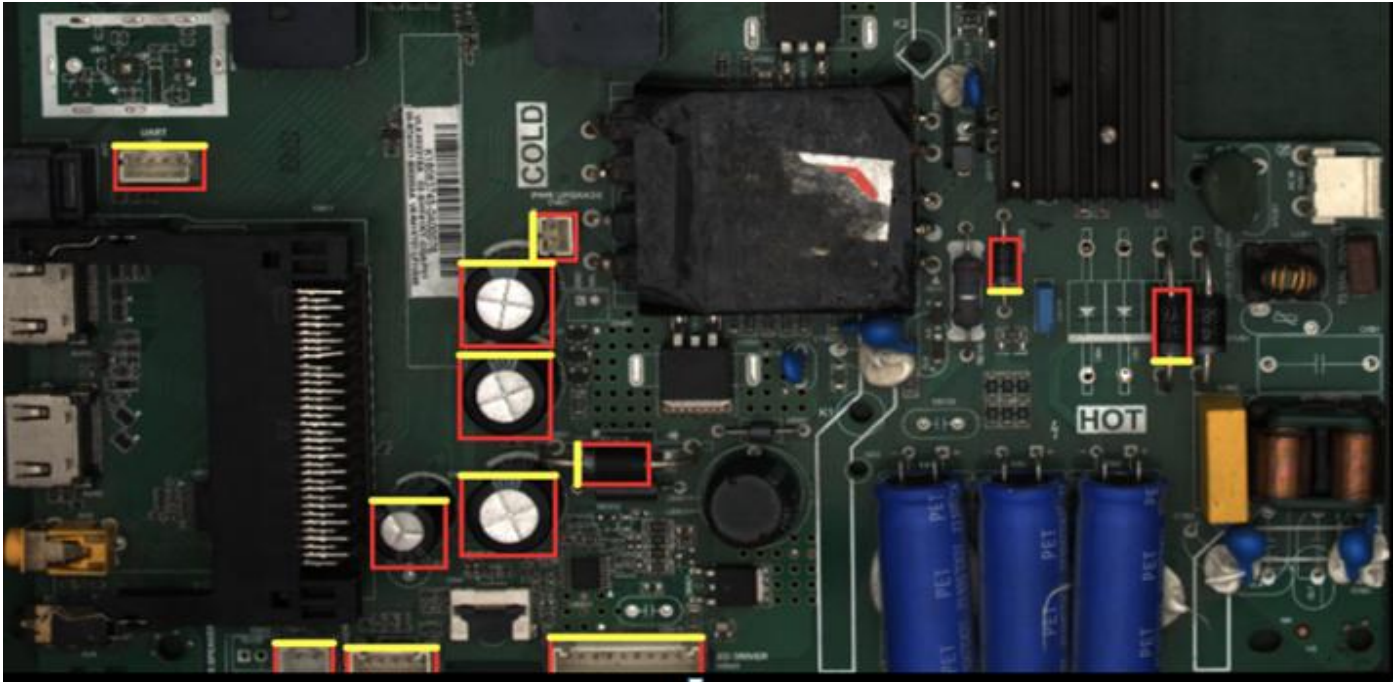
Features:

1. On-line PCBA AOI for plug-in before soldering.

2. High inspection rate and low false alarm rate, automatically check color ring resistor, capacitor, diode, socket, etc.

3. Defect type: wrong part, missing part, reverse polarity and other defects of DIP element.

4. Spanning erection without change of production line.

5. Simplified programming flow, very simple interface. Support batch modifying parameters with one-key.

6. Centralized control. Interconnection between multiple equipment.

7. Real-time inspection without stopping the board.

8. Easy to move, adjustable height and width.

9. Locate defects quickly and can control production line.

10. PCBA dimensions: Maximum 400*266mm (20MP) / Maximum 520*390mm (31MP) Multiple selectable options.

11. Data is traceable. Support SPC alarm, LOG automatic collecting and storage function, NG warning/alarm function, Remote programming&debugging.
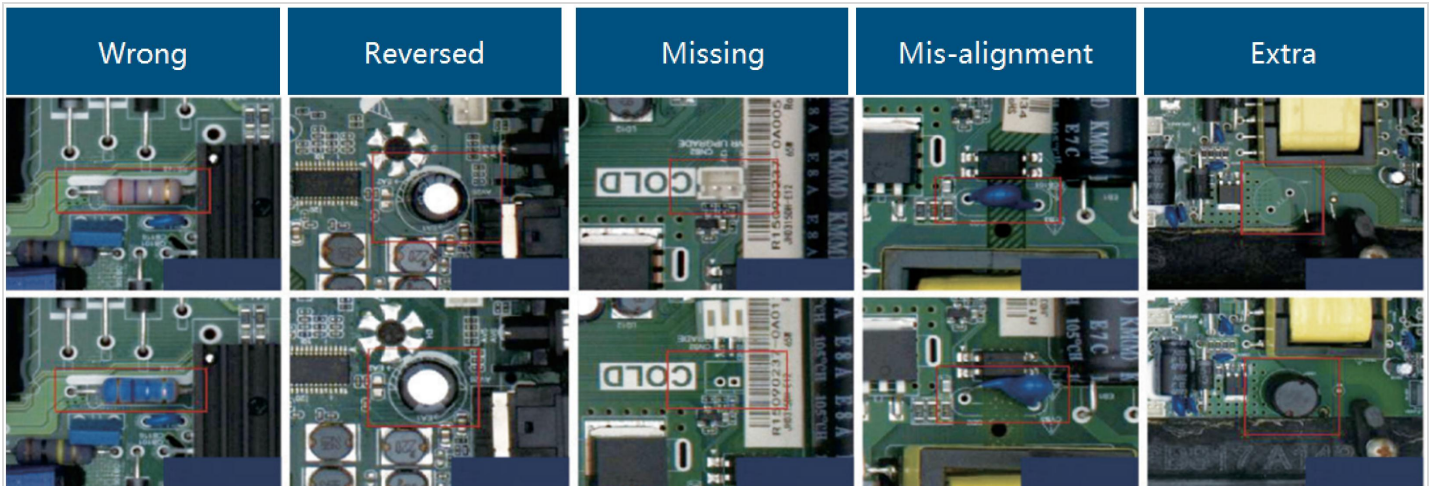
Advantage:

Deep Learning Algorithm

I.C.T AOI by applying deep learning algorithm, big data optimization and intelligent minimalist programming in industrial inspection, I.C.T enables intelligent judgment by one-click automatic identification of components and solder joints, thus addressing the two major pain points of traditional algorithms, namely, long programming time and high false alarm rate.

Flexible procedures

1. Intelligent algorithm: Automatically check color ring resistor, capacitor, diode, socket, etc.

2. Online/Offline programming: Optimize and adjust equipment parameters without stopping production line.

3. Easily operate: 10-20min programming time and 10-15min debugging time.

4. Quick operation: Short changeover time. Files of existing formats can be called directly.

5. Audible alarm: Prompt item number, wrong device and type.

Wrong	Reversed	Missing	Mis-alignment	Extra

Strong Intelligent Inspection Capability

1. Strong feature fuzzy identification capability,able to inspect defect of color ring resistor.

2. Effectively inspect polarity without being interfered by silkscreen on board and change of characters on device.

3. Super strong same color distinguishing ability, effectively identify missing parts and reverse polarity of black devices on black board, black feature on black devices, white socket and jumper on white board and thermistor on green board.
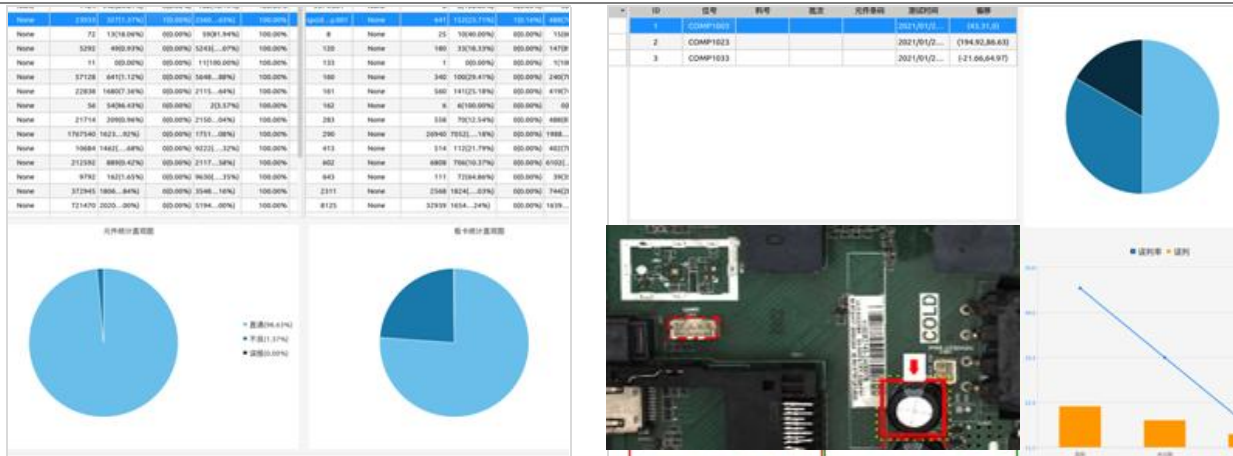
4. Excellent generalization ability.
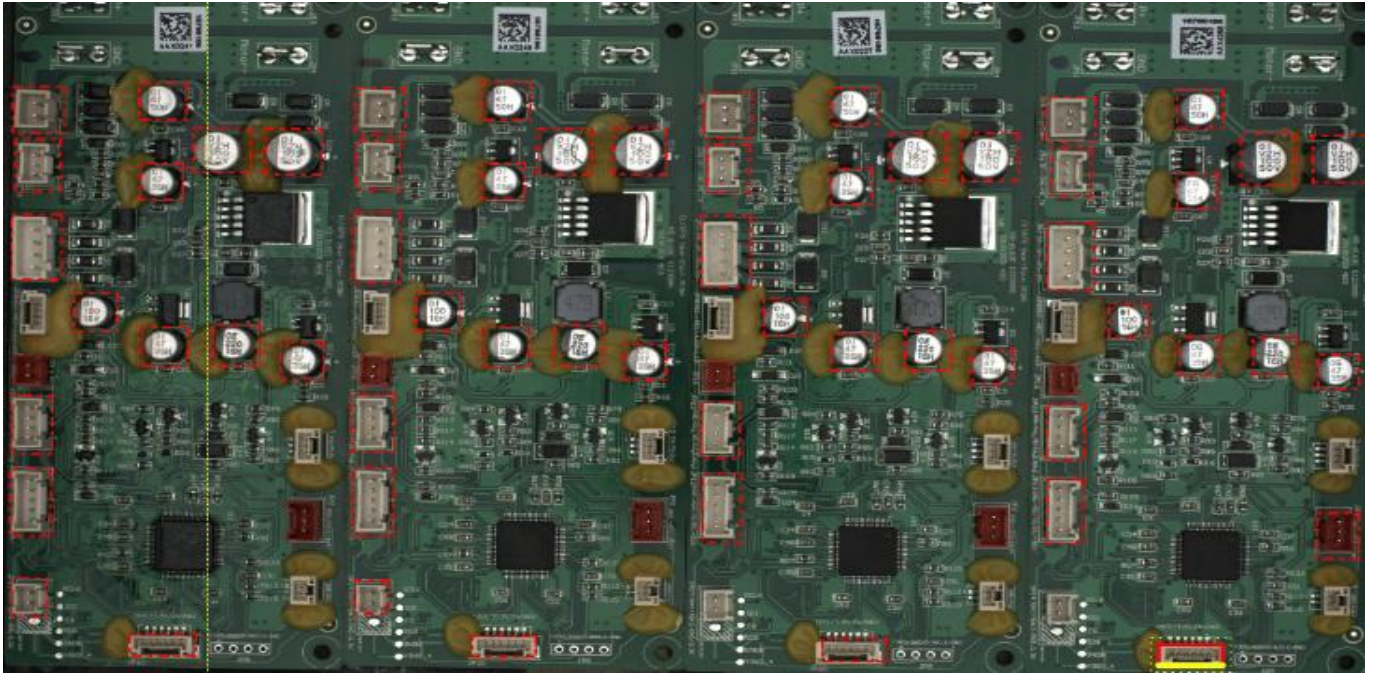
Quick Inspection Speed

1. Flexibly respond to high capacity and situation with/without fixture.

2. Online inspection. Inspection time is not influenced by line speed(up to 1.8m/min).

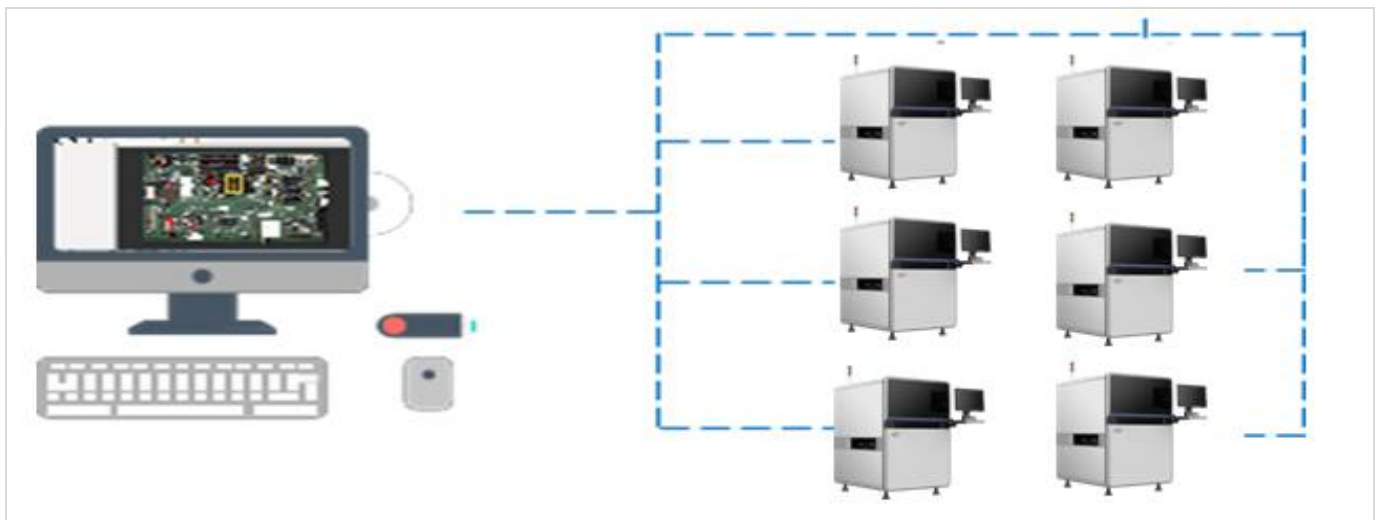3. Inspection results can be obtained immediately upon board coming out of inspection equipment.
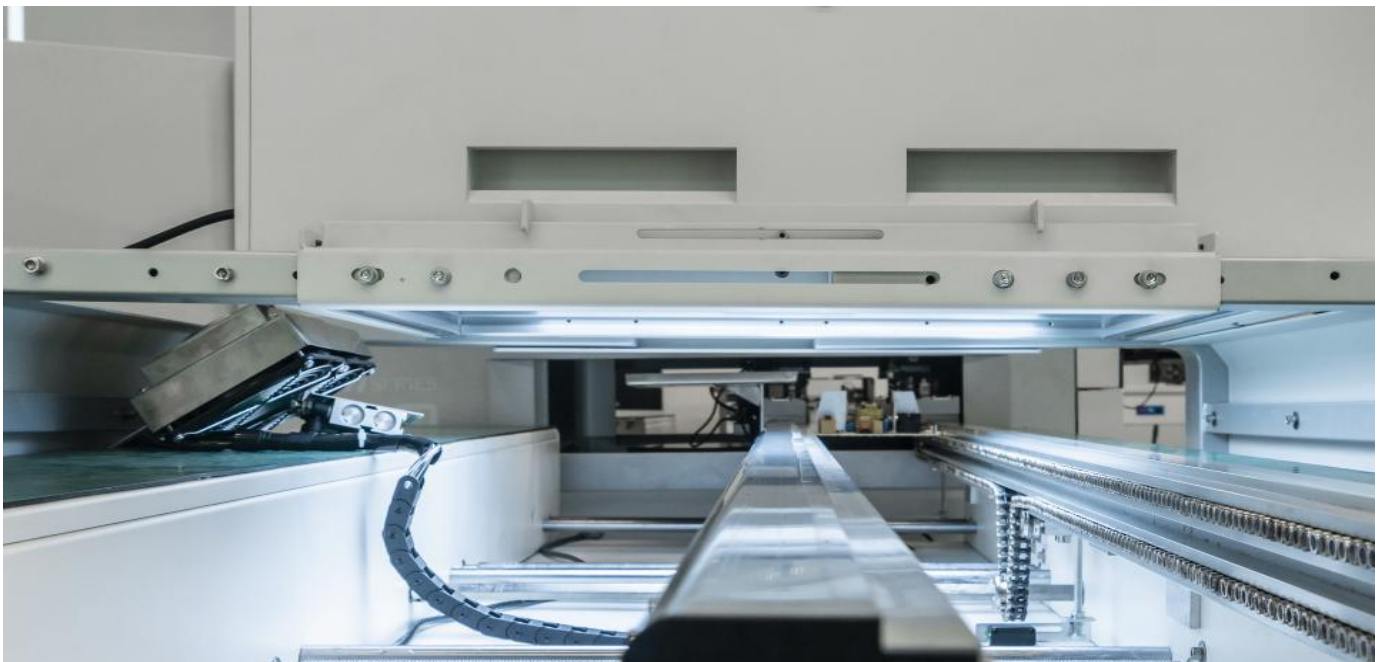
Multiple Inspection Modes

1. Support multi-in-1 board inspection.

2. Support mixed board inspection.

3. Support mixed material inspection.

4. Support rotation identification of multiple angles and multiple positions.

MES System Data Report

1. Camera automatically reads code (bar code and QR code).

2. Complete data, including overall statistic data and all inspection information of each board inspected.

3. Support one-key export, which is convenient for traceback. Data can be effectively applied in MES system.

Centralized Management and flexible Service

1. Support remote programming, debugging and management. Save changeover time. Support one-to-many judgment.

2. Remote regulation, centralized management. Reduce suspension of work. Enhance production efficiency.

3. Remote off-line programming, which will not affected inspection.

4. Remote support. Quick response and maintenance.

5. Multi-judgment work station realizes one-to-many judgment.

Option:

Production Line Control Box	**NG Board LED Tracker**
Automatic/manual control of production line start and pause, forward and reverse, ensure timely repair of defects.	Quick locate position of NG board by LED lights to enhance repair efficiency.

Specification:

Model	I.C.T DIP Online AOI AI-4026 (Before THT Soldering)	I.C.T DIP Online AOI AI-4026L (Before THT Soldering)
FOV	400*300mm	520*380mm
Resolution	75um	80um
Camera	20M	31M
Light	W light source	W+Strip light, 4 sides
Inspection Algorithm	CNN, Color contrast, Outline recognition, Offset inspection, Template matching, Character comparison, OCR ,etc.	
Inspection Item	Component: Absent, Reversed, Mis alignment, Broken, Extra, Foreignmaterial, Stained, etc. Other: NG tracking bar(optional), Control box(optional), Mixed material inspection, Panel inspection.	
Mixing PCB inspection	Support calling program automatically.	
PCB Size	50*50mm~400*300mm	50*50mm~520*380mm
Operation System	Ubuntu 18.04 LTS 64bit Remote control, remote assistance, CAD file import and user-defined model training	
PC	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	CPU: Intel i7 Display card: NVIDIA GTX1050Ti Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
Display	23.8 inch FHD display	
Data output	Autogenerated statistic analysis SPC	
Special function	Automatic search of elements and quick programming	
Power	AC220, 50/60Hz, 5A	
Rated power	200W	
Compressed Air	0.5~0.6Mpa	
Communication	SMEMA	
Weight	100Kg	
Dimension	L715*W790~1210*H1315~1700mm	

Dimension:

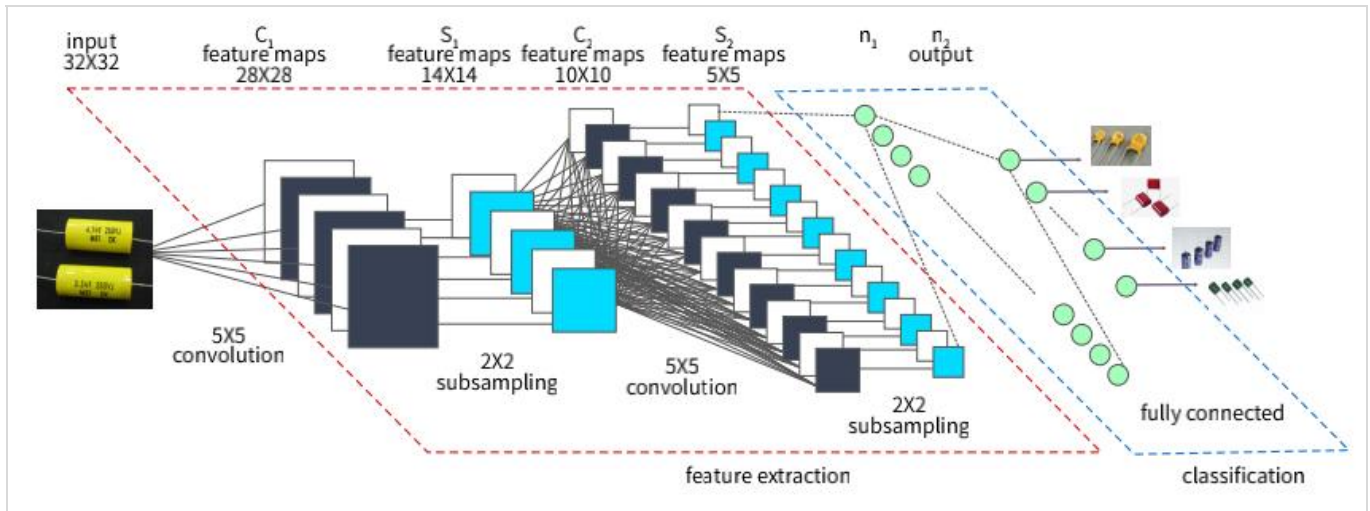**I.C.T DIP Inverted Camera Online AOI AI-4540 (After THT Soldering)**

I.C.T DIP AOI captures board image in real time by high precision color industrial camera. Adopt Convolution Neural Network (CNN) algorithm to process images. Judge defects of components intelligently.

Features:

1. Online PCBA AOI for plug-in after soldering.

2. High inspection rate and low false alarm rate, automatically check color ring resistor, capacitor, diode, socket, etc.

3. Defect type: wrong part, missing part, reverse polarity and other defects of DIP element.

4. Spanning erection without change of production line.

5. Simplified programming flow, very simple interface. Support batch modifying parameters with one-key.

6. Centralized control. Interconnection between multiple equipment.

7. Real-time inspection without stopping the board.

8. Easy to move, adjustable height and width.

9. Locate defects quickly and can control production line.

10. Data is traceable. Support SPC alarm, LOG automatic collecting and storage function, NG warning/alarm function, Remote programming&debugging.
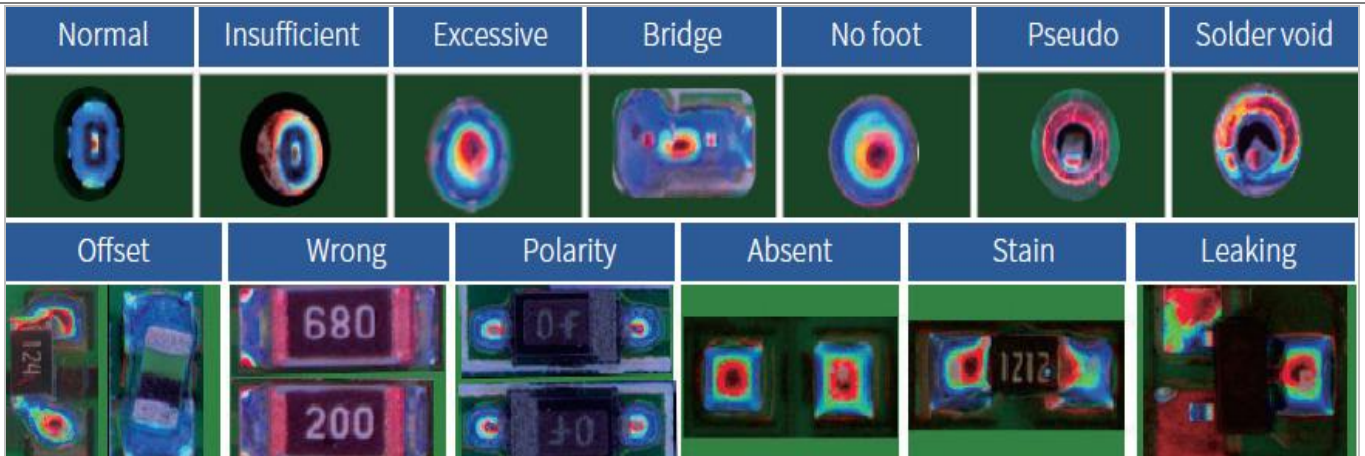
Advantage:

Deep Learning Algorithm

I.C.T AOI by applying deep learning algorithm, big data optimization and intelligent minimalist programming in industrial inspection, I.C.T enables intelligent judgment by one-click automatic identification of components and solder joints, thus addressing the two major pain points of traditional algorithms, namely, long programming time and high false alarm rate.
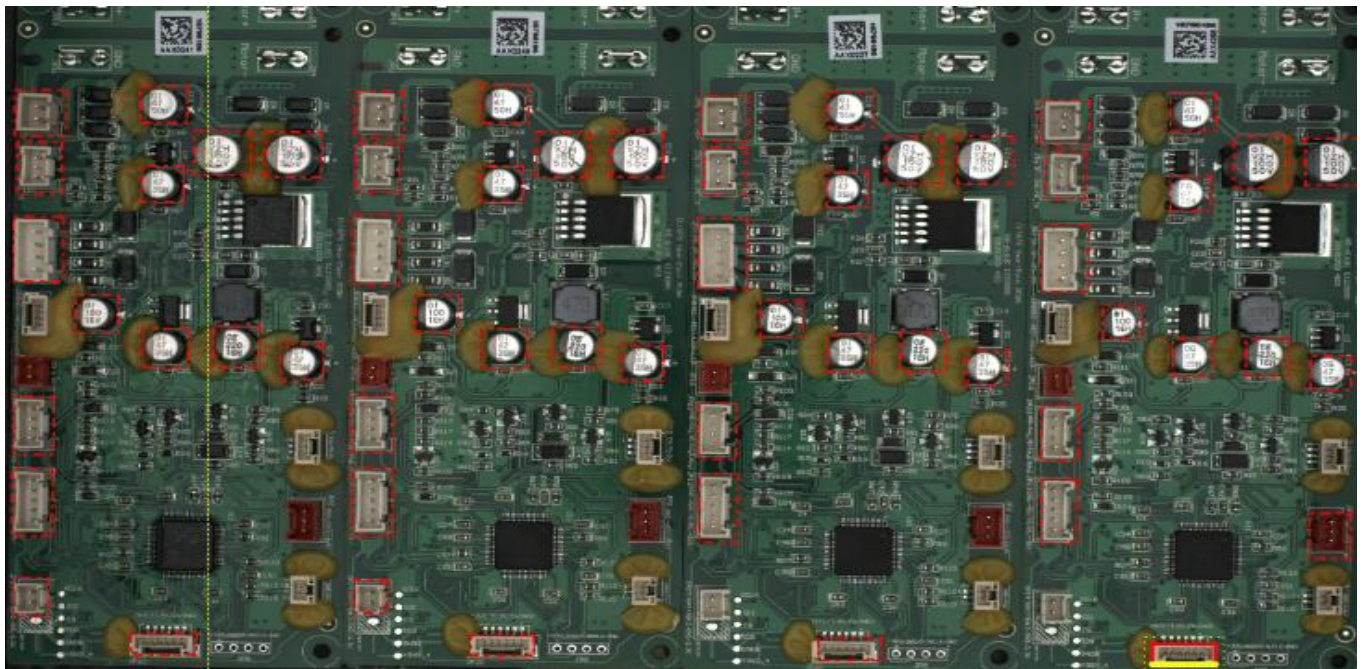

Flexible procedures

1. Intelligent algorithm: Automatically check color ring resistor, capacitor, diode, socket, etc.

2. Online/Offline programming: Optimize and adjust equipment parameters without stopping production line.

3. Easily operate: 10-20min programming time and 10-15min debugging time.

4. Quick operation: Short changeover time. Files of existing formats can be called directly.

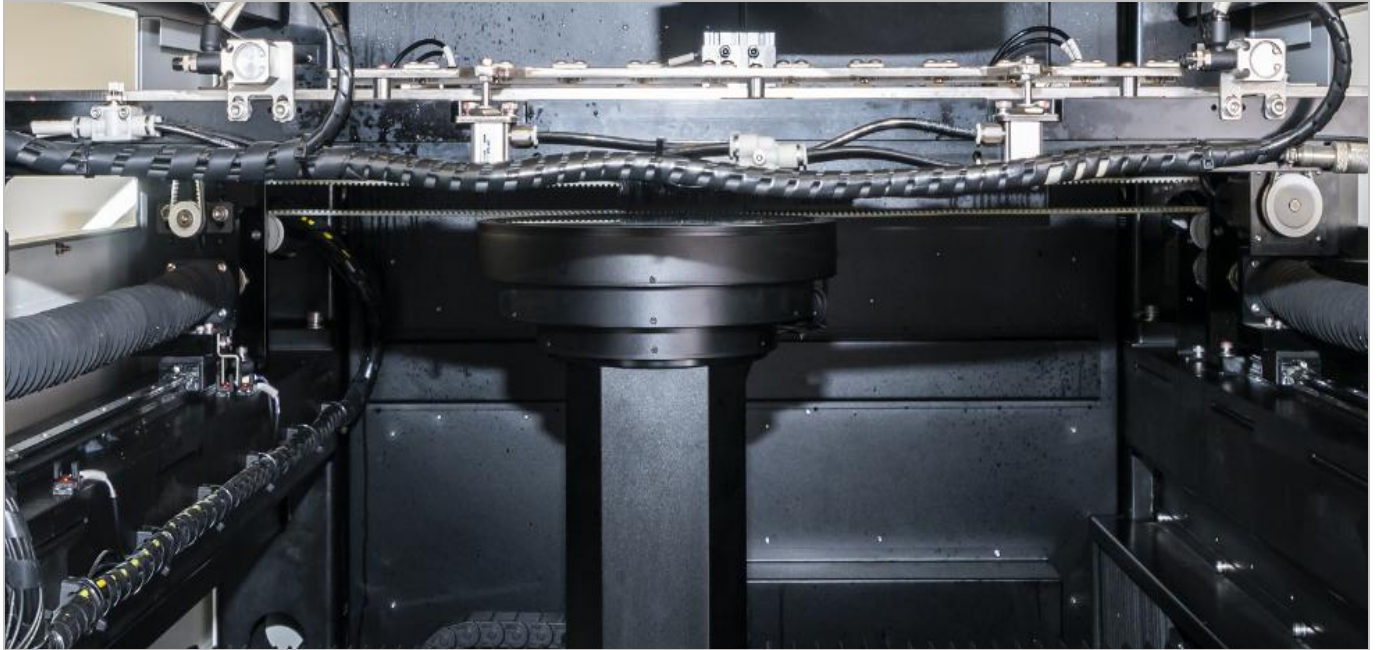5. Audible alarm: Prompt item number, wrong device and type.

Normal	Insufficient	Excessive	Bridge	No foot	Pseudo	Solder void

Offset	Wrong	Polarity	Absent	Stain	Leaking

Strong Intelligent Inspection Capability

1. For BOTTOM surface of wave soldering process, elements of solder joint change significantly. Algorithm is required to identify different NG board and OK board. Miss inspection is not allowed.

2. I.C.T DIP AOI is trained based on big data. Accuracy of components identification is high.

3. Inspection capability and generalization ability is strong. Correct alarm caused by components overhang. Reduce false alarm.

4. Convolution Neural Network (CNN) adopts judgment approach similar to human beings. Effectively identify diversified testing scenarios. Ensure inspection rate and reduce false alarm rate at the same time.

5. Strong feature fuzzy identification capability. Effectively inspect pin hole on soldering tin without being interrupted by pin and device.

6. Strong generalization ability. Slight color difference and irregular arrangement of solder joint. Low false alarm rate can be realized.
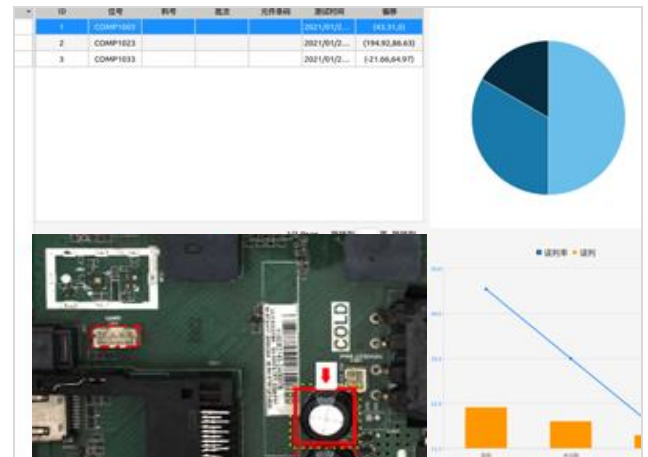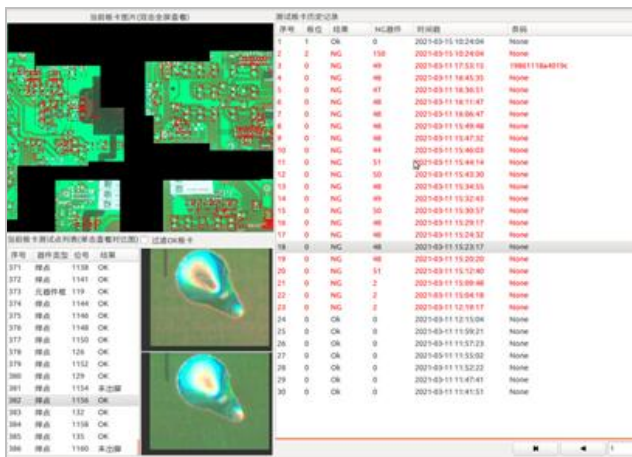

Quick Inspection Speed

1. I.C.T AOI Genetic algorithm path planning.

2. Less number of FOV, Intelligently skip positions without welds. Reduce number of FOV and enhance efficiency.

3. Photographing path is shorter. Reduce large-span FOV skipping to further save time.

4. More suitable imaging position, Avoid solder joint at FOV joint to guarantee test results.

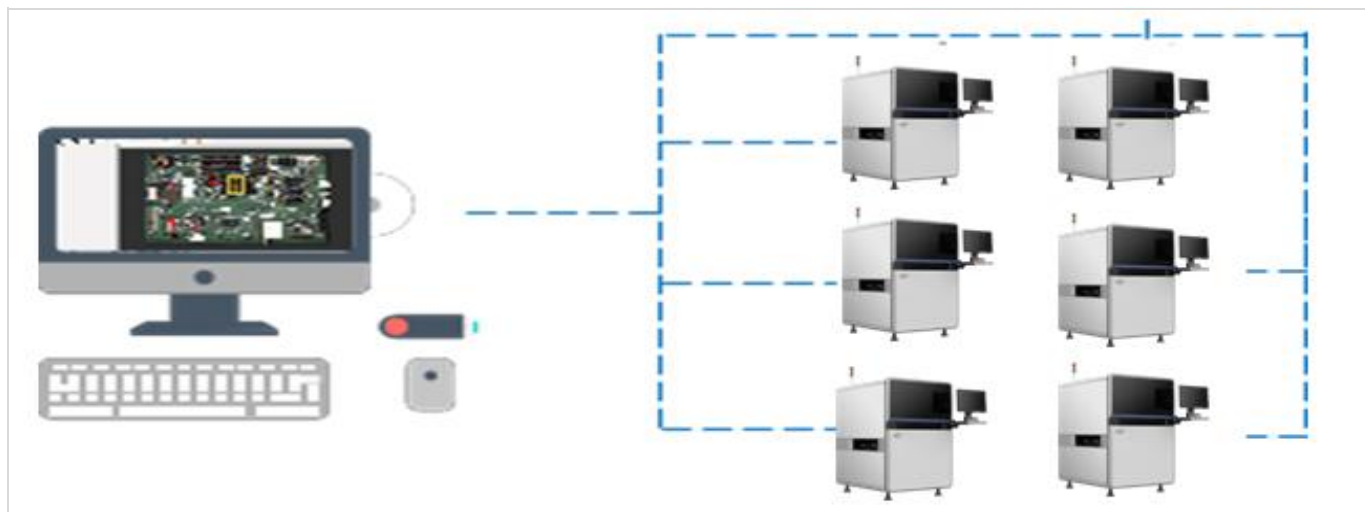5. GPU image parallel processing, Faster data running speed.

Multiple Inspection Modes

1. Support multi-in-1 board inspection, Support mixed board inspection, Support mixed material inspection.

2. Support rotation identification of multiple angles and multiple positions.

3. Support Bad Mark skip.

MES System Data Report

1. Camera automatically reads code (bar code and QR code).

2. Complete data, including overall statistic data and all inspection information of each board inspected.

3. Support one-key export, which is convenient for traceback. Data can be effectively applied in MES system.

Centralized Management and flexible Service

1. Support remote programming, debugging and management. Save changeover time. Support one-to-many judgment.

2. Remote regulation, centralized management. Reduce suspension of work. Enhance production efficiency.

3. Remote off-line programming, which will not affected inspection.

4. Remote support. Quick response and maintenance.

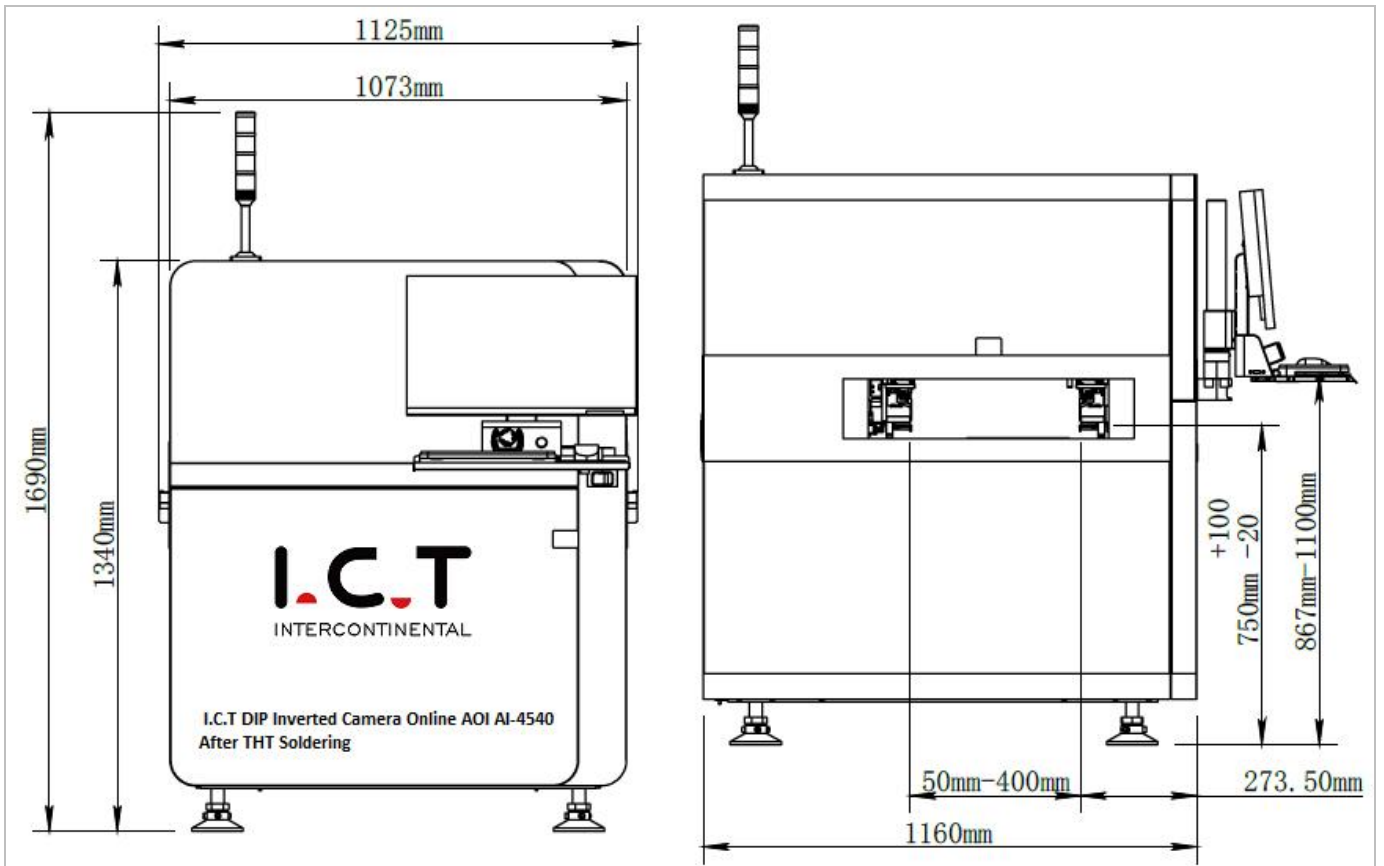5. Multi-judgment work station realizes one-to-many judgment.

Option:

Offline Repair station	**Online Repair station**

1. Offline/Online option

2. Freely switch between single-point/multiple-point cursor guide. High alignment accuracy.

3. Whole board projection guide maintenance personnel to repair quickly.

4. Avoid manual searching. Support operation on multiple work station. Enhance repair efficiency.

5. Multiple guide colors for selection.

6. Avoid interference by board color.

7. Guide by areas. Higher efficiency.

Specification:

Model	I.C.T DIP Inverted Camera Online AOI AI-4540 (After THT Soldering)	I.C.T DIP Inverted Camera Online AOI AI-4540L (After THT Soldering)
FOV	60*45mm	
Resolution	15um	
Camera	12M	
Light	RGB + W light, 4 color integral	
Inspection Speed	0.23sec/FOV	

Inspection Algorithm	CNN, Color contrast, Outline recognition, Offset inspection, Template matching, Character comparison, OCR, etc.
Inspection Item	Component: Absent, Reversed, Mis alignment, Broken, Extra, Foreignmaterial, Stained, etc. Solder: Insufficient, Excessive, Bridge, No foot, Solder void, etc. Other: Bar code Recognition / QR code Recognition/ OCR.
Mixing PCB Inspection	Support calling program automatically.
PCB Size	Three section track: 50*50-350*400mm Single section track: 50*50-450*400mm	50*50~550*650mm
PCB Height	Top: 110mm (150mm optional), Bottom: 25mm
PCB Thickness	0.5~6.0mm
PCB Edge	3.0mm
PCB Warpage	±3.0mm
PCB Weight	Max: 10Kg
Conveyor Height	750&900±20mm
With Adjustment	Manual/Auto
Conveyor Direction	L ~R or R ~L
Motion Driver	AC servo driver + Ballscrew, repeat accuracy 0.01mm
Operation System	Ubuntu 18.04 LTS 64bit Remote control, remote assistance, CAD file import and user-defined model training
PC	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 32G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
Display	23.8 inch FHD display
Data output	Autogenerated statistic analysis SPC
Special function	Automatic search of elements and quick programming
Power	AC220 50/60Hz,5A
Rated power	520W
Compressed Air	0.4~0.6Mpa
Communication	SMEMA
Weight	780Kg	890Kg
Dimension	L1100*W1160*H1340mm	L1125*W1410*H1340mm

Dimension:

* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.

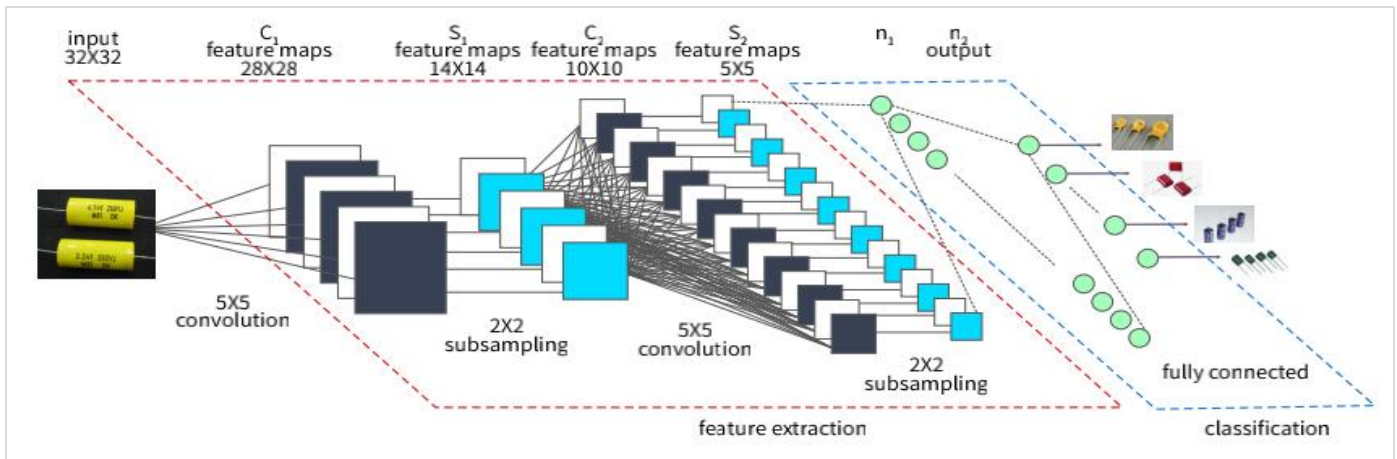**I.C.T DIP On-line Dual side AOI AI-5146W (After THT Soldering)**

I.C.T DIP dual side AOI captures board image in real time by high precision color industrial camera. Adopt Convolutional Neural Network (CNN) algorithm to process images. Judge defects of components intelligently.
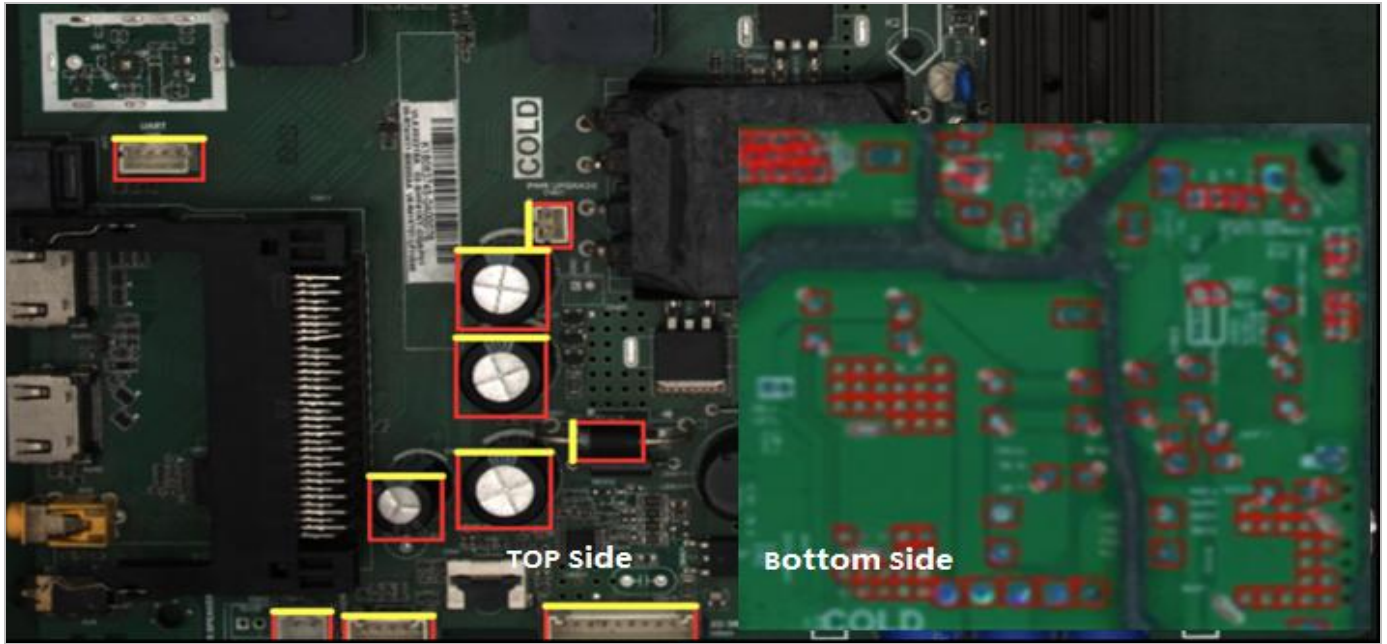
Features:

1. On-line DIP dual side AOI for plug-in after soldering.

2. High inspection rate and low false alarm rate, automatically check color ring resistor, capacitor, diode, socket, etc.

3. Defect type:wrong part, missing part, reverse polarity and other defects of DIP element.

4. Spanning erection without change of production line.

5. Simplified programming flow, very simple interface. Support batch modifying parameters with one-key.

6. Centralized control. Interconnection between multiple equipment.

7. Real-time inspection without stopping the board.

8. Easy to move, adjustable height and width.

9. Locate defects quickly and can control production line.

10. Data is traceable. Support SPC alarm,LOG automatic collecting and storage function,NG warning/alarm function, Remote programming&debugging.
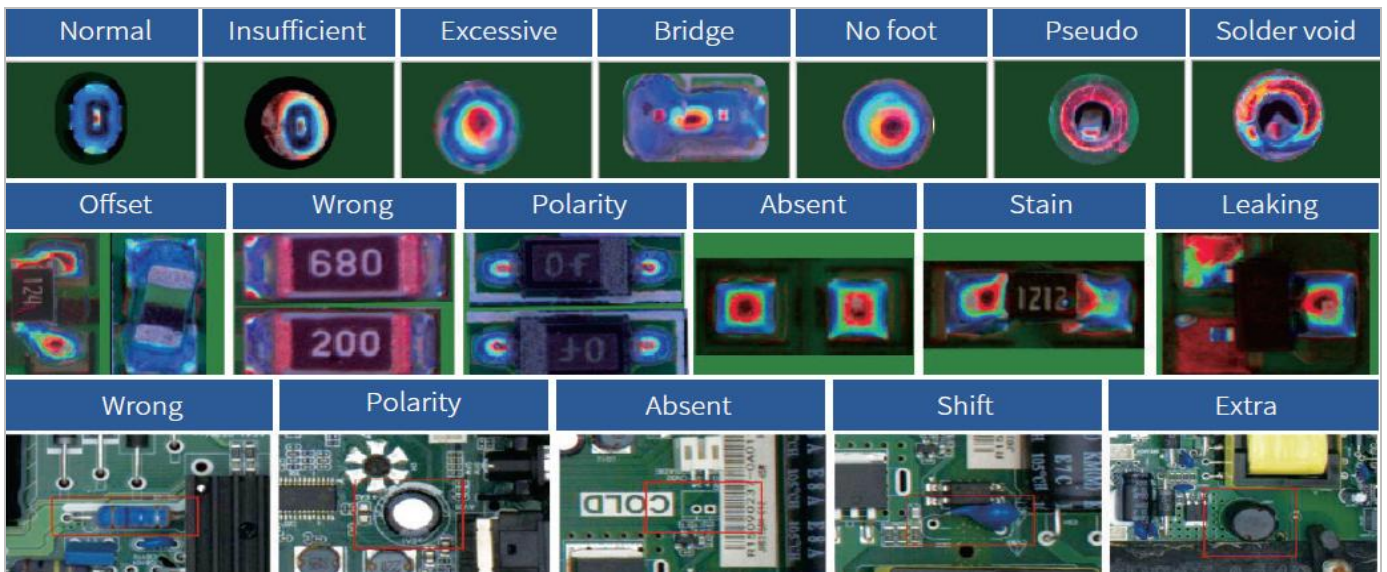
Advantage:

Deep Learning Algorithm

I.C.T AOI by applying deep learning algorithm, big data optimization and intelligent minimalist programming in industrial inspection, I.C.T enables intelligent judgment by one-click automatic identification of components and solder joints, thus addressing the two major pain points of traditional algorithms, namely, long programming time and high false alarm rate.
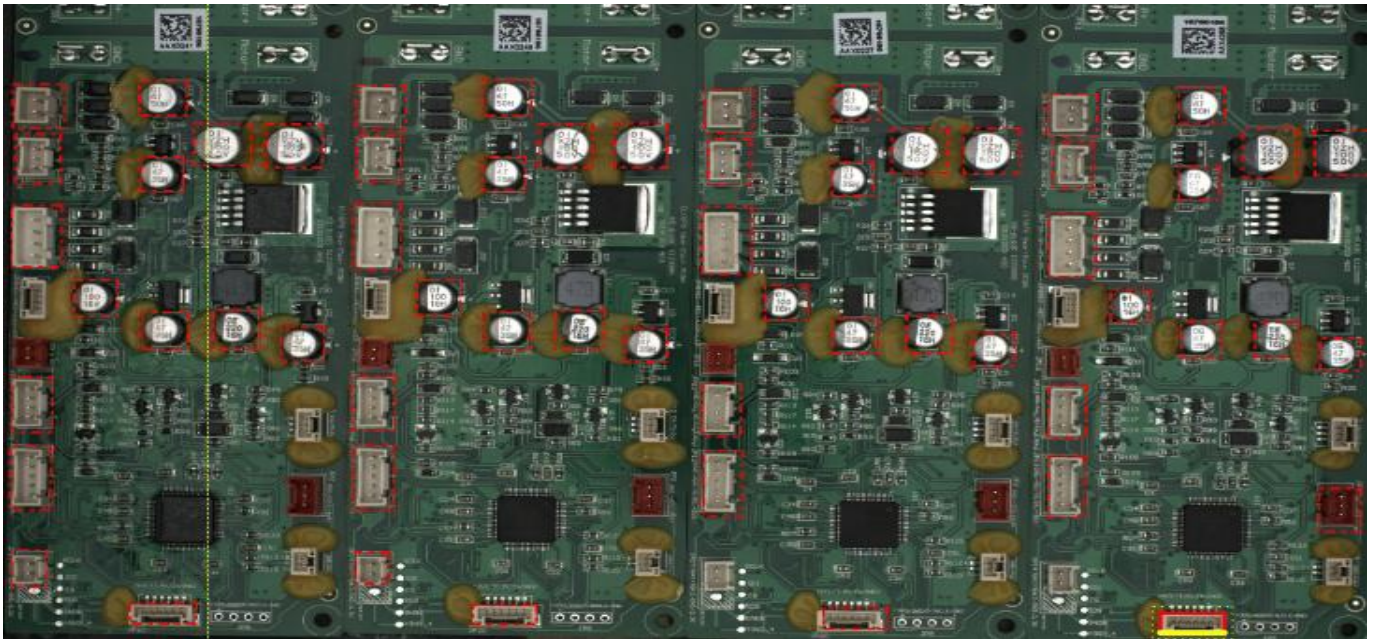
Flexible procedures

1. Intelligent algorithm: Automatically check color ring resistor, capacitor, diode, socket, etc.

2. Online/Offline programming: Optimize and adjust equipment parameters without stopping production line.

3. Easily operate: 10-20min programming time and 10-15min debugging time.

4. Quick operation: Short changeover time. Files of existing formats can be called directly.

5. Audible alarm: Prompt item number, wrong device and type.

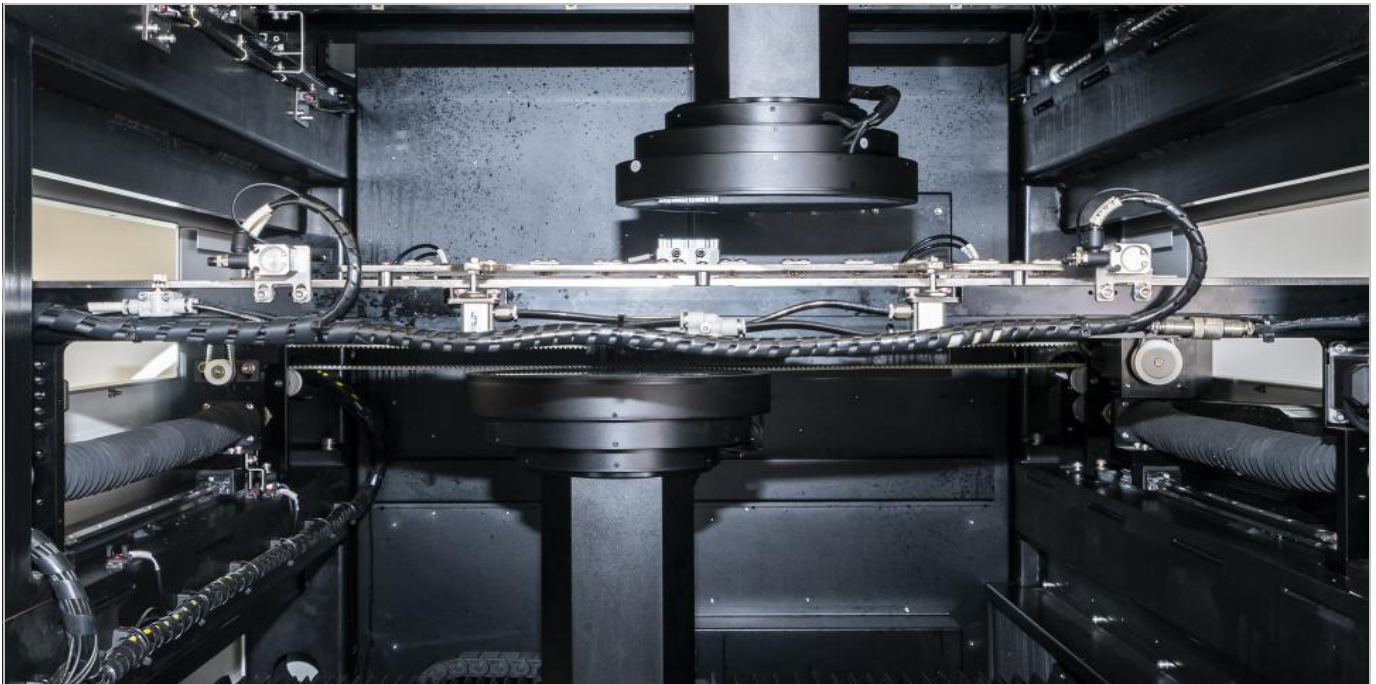**Strong Intelligent Inspection Capability**

1. For BOTTOM surface of wave soldering process, elements of solder joint change significantly. Algorithm is required to identify different NG board and OK board. Miss inspection is not allowed.

2. I.C.T DIP AOI is trained based on big data. Accuracy of components identification is high.

3. Inspection capability and generalization ability is strong. Correct alarm caused by components overhang. Reduce false alarm.

4. Convolutional Neural Network (CNN) adopts judgment approach similar to human beings. Effectively identify diversified testing scenarios. Ensure inspection rate and reduce false alarm rate at the same time.

5. Strong feature fuzzy identification capability. Effectively inspect pin hole on soldering tin without being interrupted by pin and device.

6. Strong generalization ability. Slight color difference and irregular arrangement of solder joint. Low false alarm rate can be realized.

Quick Inspection Speed

1. I.C.T AOI Genetic algorithm path planning.

2. Less number of FOV, Intelligently skip positions without welds. Reduce number of FOV and enhance efficiency.

3. Photographing path is shorter. Reduce large-span FOV skipping to further save time.

4. More suitable imaging position. Avoid solder joint at FOV joint to guarantee test results.

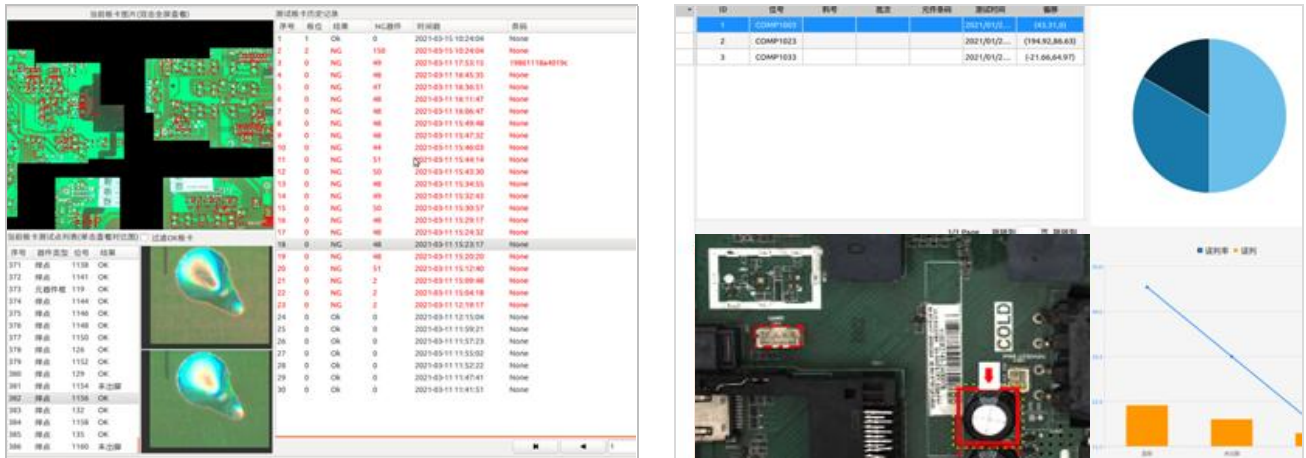5. GPU image parallel processing, Faster data running speed.

Multiple Inspection Modes

1. Support multi-in-1 board inspection, Support mixed board inspection, Support mixed material inspection.

2. Support rotation identification of multiple angles and multiple positions.
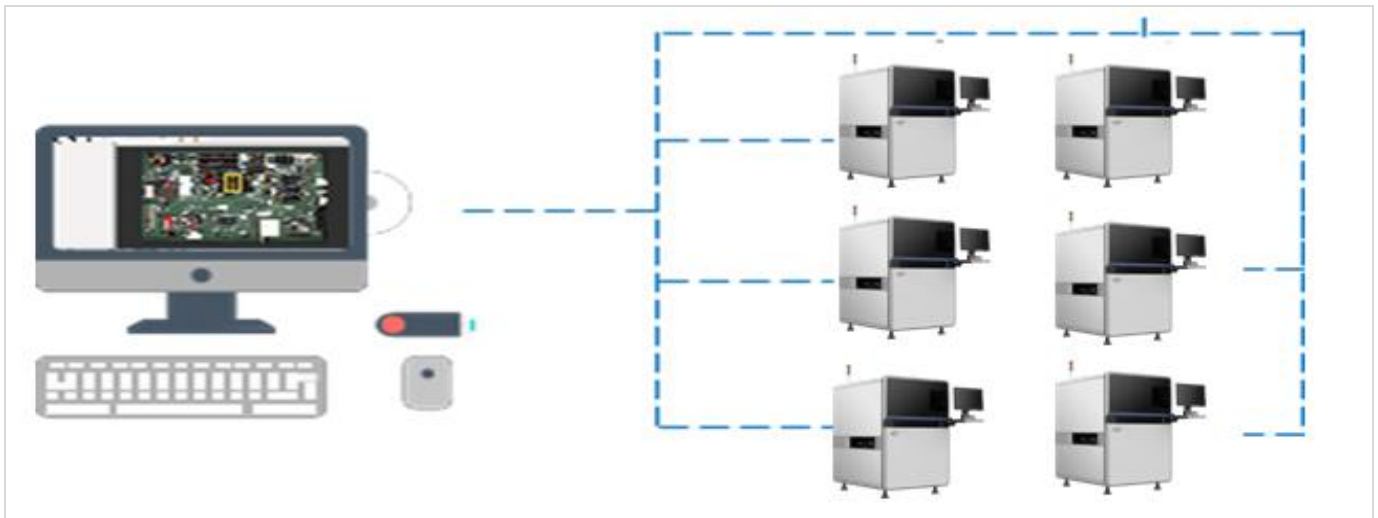
3. Support Bad Mark skip.

MES System Data Report

1. Camera automatically reads code (bar code and QR code).

2. Complete data, including overall statistic data and all inspection information of each board inspected.

3. Support one-key export, which is convenient for traceback. Data can be effectively applied in MES system.

Centralized Management and flexible Service

1. Support remote programming, debugging and management. Save changeover time. Support one-to-many judgment.

2. Remote regulation, centralized management. Reduce suspension of work. Enhance production efficiency.

3. Remote off-line programming, which will not affected inspection.

4. Remote support. Quick response and maintenance.

5. Multi-judgment work station realizes one-to-many judgment.

Option:

|	
Offline Repair station	**Online Repair station**

1. Offline/Online option

2. Freely switch between single-point/multiple-point cursor guide. High alignment accuracy.

3. Whole board projection guide maintenance personnel to repair quickly.

4. Avoid manual searching. Support operation on multiple work station. Enhance repair efficiency.

5. Multiple guide colors for selection.

6. Avoid interference by board color.

7. Guide by areas. Higher efficiency.

Specification:

Model	I.C.T DIP On-line Dual side AOI AI-5146W (After THT Soldering)	I.C.T DIP On-line Dual side AOI AI-5146WL (After THT Soldering)
Resolution&FOV	15um@60*45mm/10um@40*30mm	
Camera	12M	
Light	RGB + W light, 4 color integral	
Inspection Speed	0.23sec/FOV	
Inspection Algorithm	CNN, Color contrast, Outline recognition, Offset inspection, Template matching, Character comparison, OCR, etc.	
Inspection Item	Component: Absent, Reversed, Mis alignment, Broken, Extra, Foreignmaterial, Stained, etc. Solder: Insufficient, Excessive, Bridge, No foot, Solder void, etc. Other: Bar code Recognition/QR code Recognition/OCR.	
Mixing PCB inspection	Support calling program automatically.	
PCB Size	50*50mm~510*460mm Three section track: 50*50mm~350*460mm Single section track: 50*50mm~430*460mm	50*50mm~510*650mm Three section track: 50*50mm~350*650mm Single section track: 50*50mm~430*650mm
PCB Height	Top:75mm, Bottom:75mm	
PCB Thickness	0.3~6.0mm	
PCB Edge	3.0mm	
PCB Warpage	±3.0mm	
PCB Weight	Max: 10Kg (chain drive)	
Conveyor Height	750&900±20mm	
With Adjustment	Manual/Auto	
Conveyor Direction	L ~R or R ~L	
Motion Driver	AC servo driver + Ballscrew, repeat accuracy 0.01mm	
Operation System	Ubuntu 18.04 LTS 64bit Remote control, remote assistance, CAD file import and user-defined model training	
PC	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 32G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	
Display	23.8 inch FHD display	
Data output	Autogenerated statistic analysis SPC	

Special function	Automatic search of elements and quick programming	
Power	AC220 50/60Hz,5A	
Rated power	520W	
Compressed Air	0.4~0.6Mpa	
Communication	SMEMA	
Weight	860Kg	1000Kg
Dimension	L1050*W1335*H1650mm	L1050*W1535*H1650mm

Dimension:
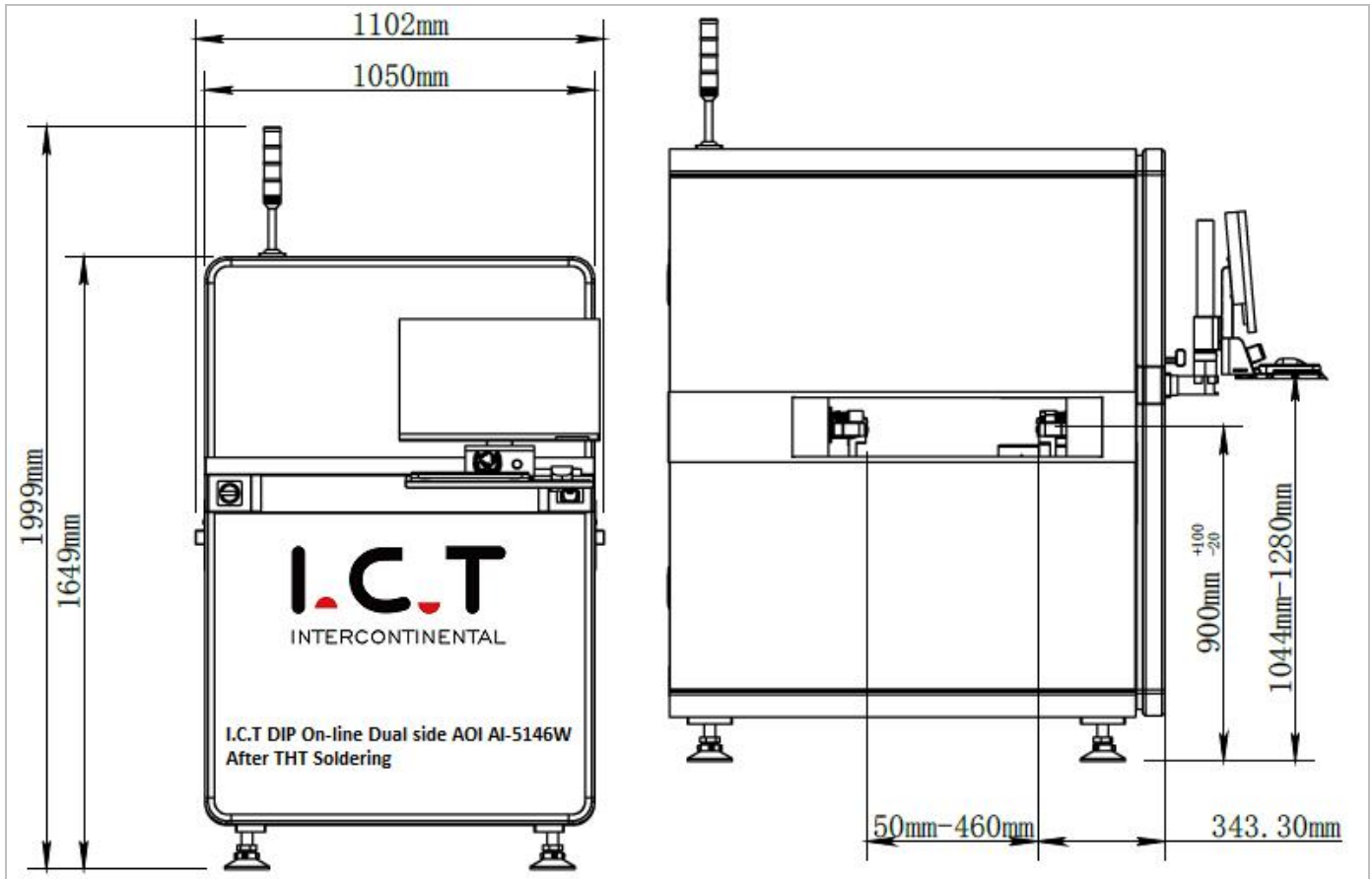
* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.

I.C.T Coating Online AOI AI-5146C

I.C.T Coating Online AOI AI-5146C for conformal coating inspection，captures board image in real time by high precision color industrial camera.

Adopt Convolutional Neural Network (CNN) algorithm to process images. Judge defects of components intelligently.

Features:

1. Online AOI for conformal coating inspection.

2. Intelligently lock coating border, Automatically identify coating area.

3. Able to coating defects. DIP defects, SMT defects, soldering defects and other defects can be application after switching light source.

4. Support multi-in-1 panel and mixed model inspection.

5. Simplified programming flow, very simple interface. Support batch modifying parameters with one-key.

6. Centralized control. Interconnection between multiple equipment.

7. Real-time inspection without stopping the board.

8. Apply UV light source, the glue containing phosphorus can clearly distinguish.

9. Multiple configurations (whole board, double side) are available.

10. Intelligently judge bubble of targeted area,Minimum bubble diameter is up to 0.05mm.

11. Data is traceable. Support SPC alarm, LOG automatic collecting and storage function, NG warning/alarm function, Remote programming&debugging.

12. UV glue thickness measurement function optional.
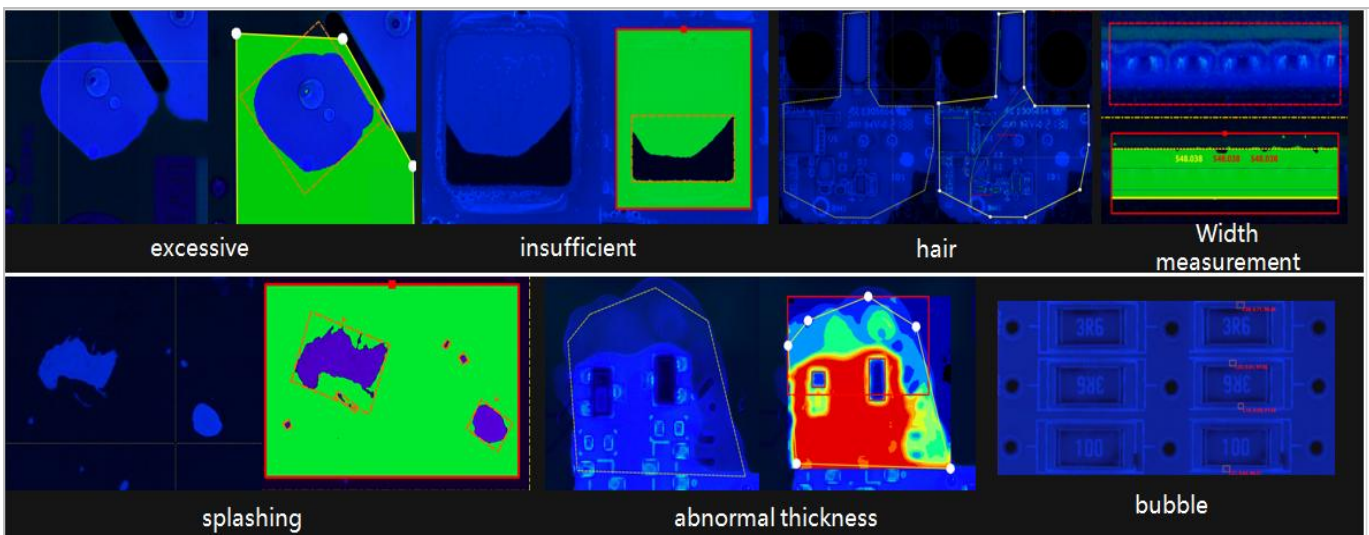
**Advantage:**
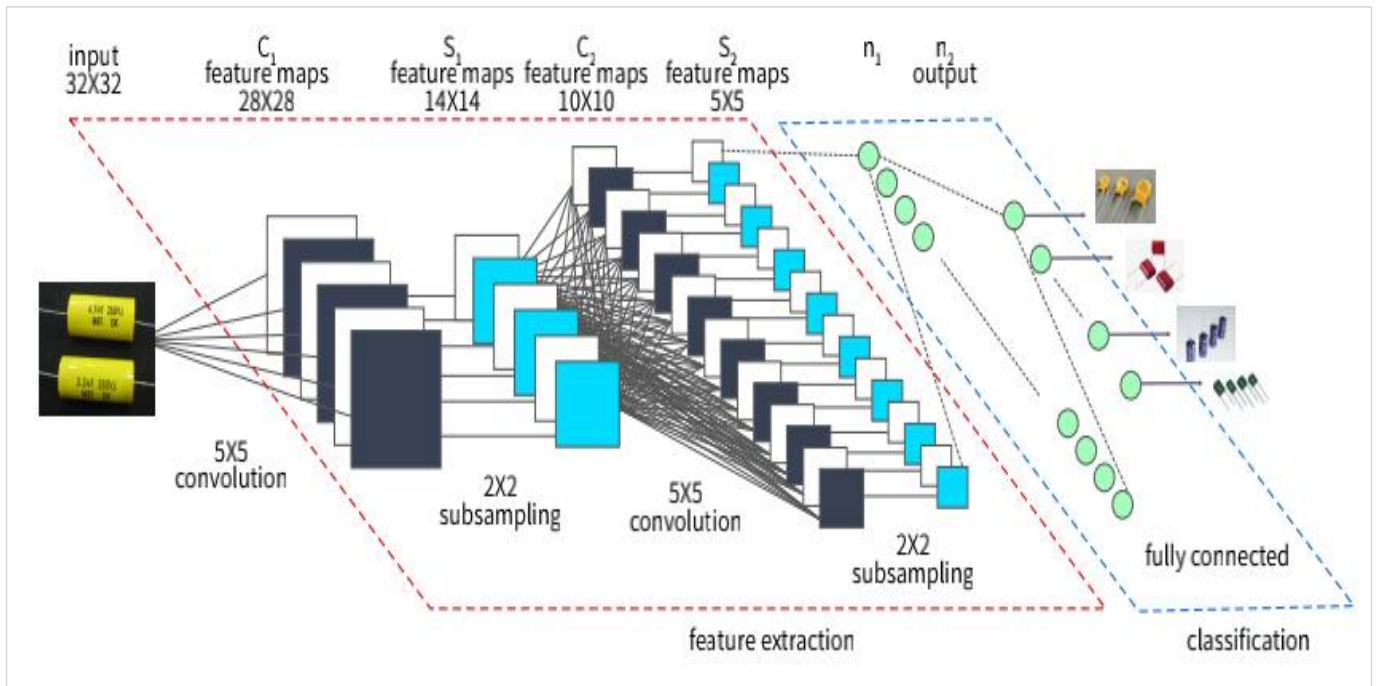
Deep Learning Algorithm

I.C.T AOI by applying deep learning algorithm, big data optimization and intelligent minimalist programming in industrial inspection. I.C.T enables intelligent judgment by one-click automatic identification of components and solder joints, thus addressing the two major pain points of traditional algorithms, namely, long programming time and high false alarm rate.
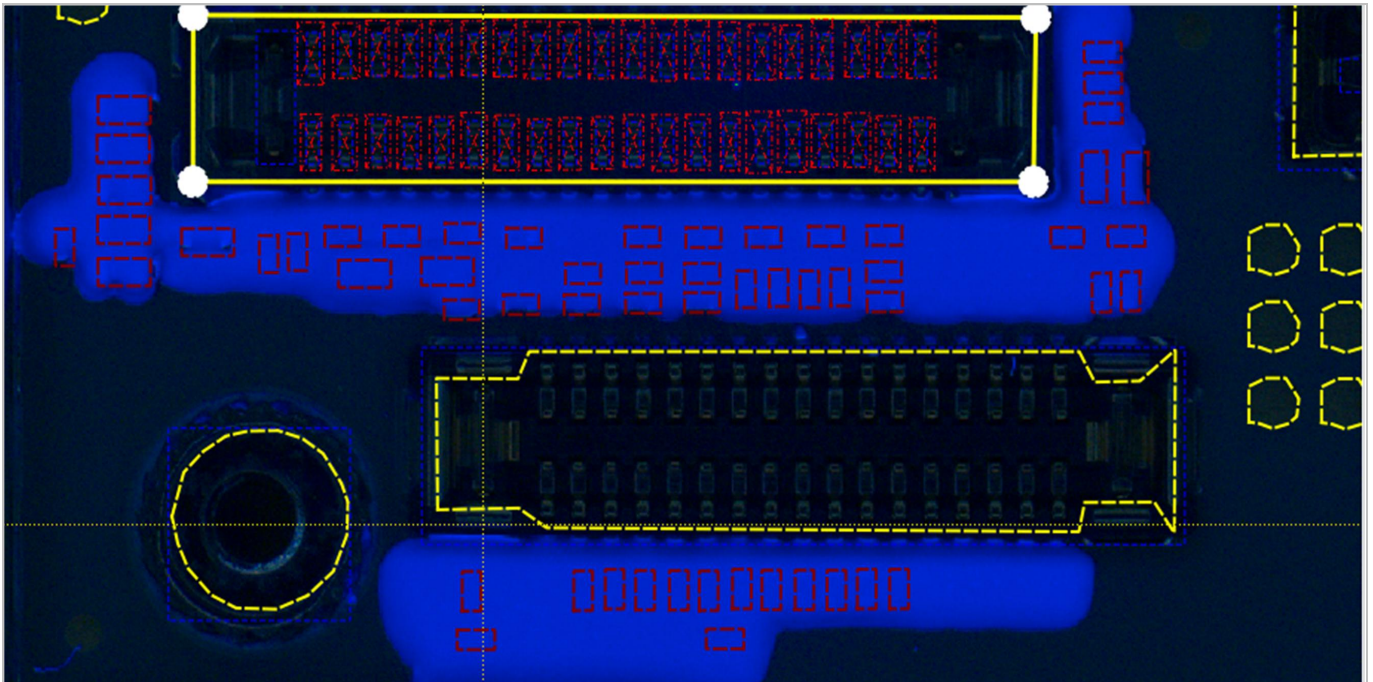

Flexible procedures

1. Intelligently lock coating border and automatically identify coating area makes programming speed fast.

2. Intelligent algorithm, Automatically identify coating area and generate ion checkbox of the same shape.

3. Flexibly select, ion area of any shape can be select. Only need to set coating or not.

4. Offline programming, Support offline programming. Convenient for modification and debugging.

5. Online programming, Files of existing formats can be called directly without repeated adjustment.

6. Easily operate,Programming time only needs 10-15min.
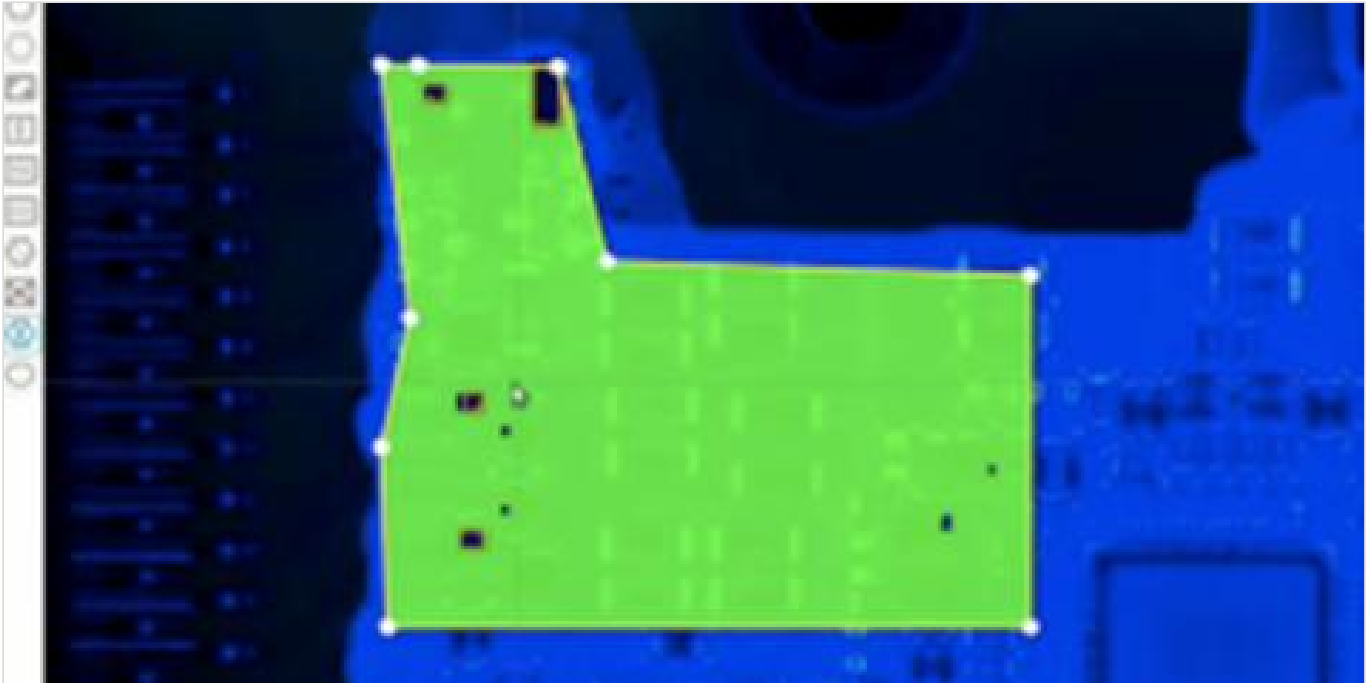
Non-coating area block

When there are individual non-coating points in the frame selection area, they can be framed and shielded by a variety of shape frames to ensure the detection accuracy and avoid the workload of re-judgment caused by false positives.
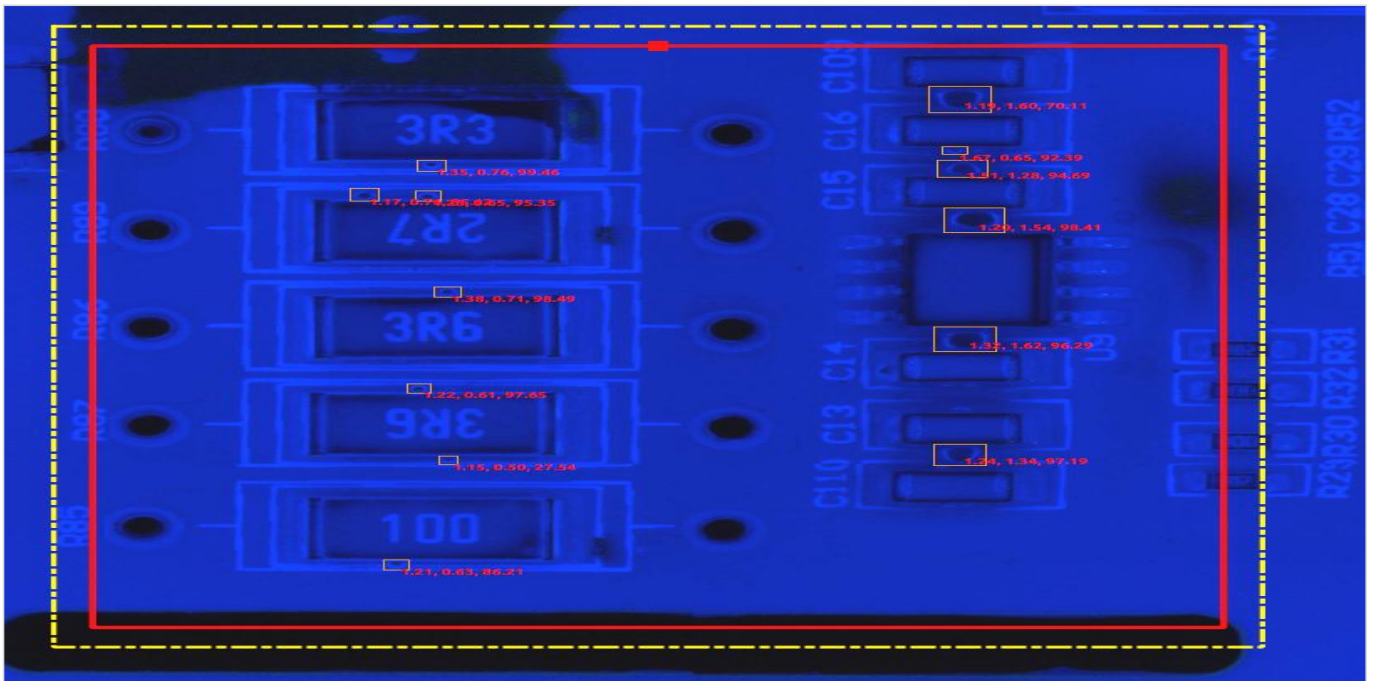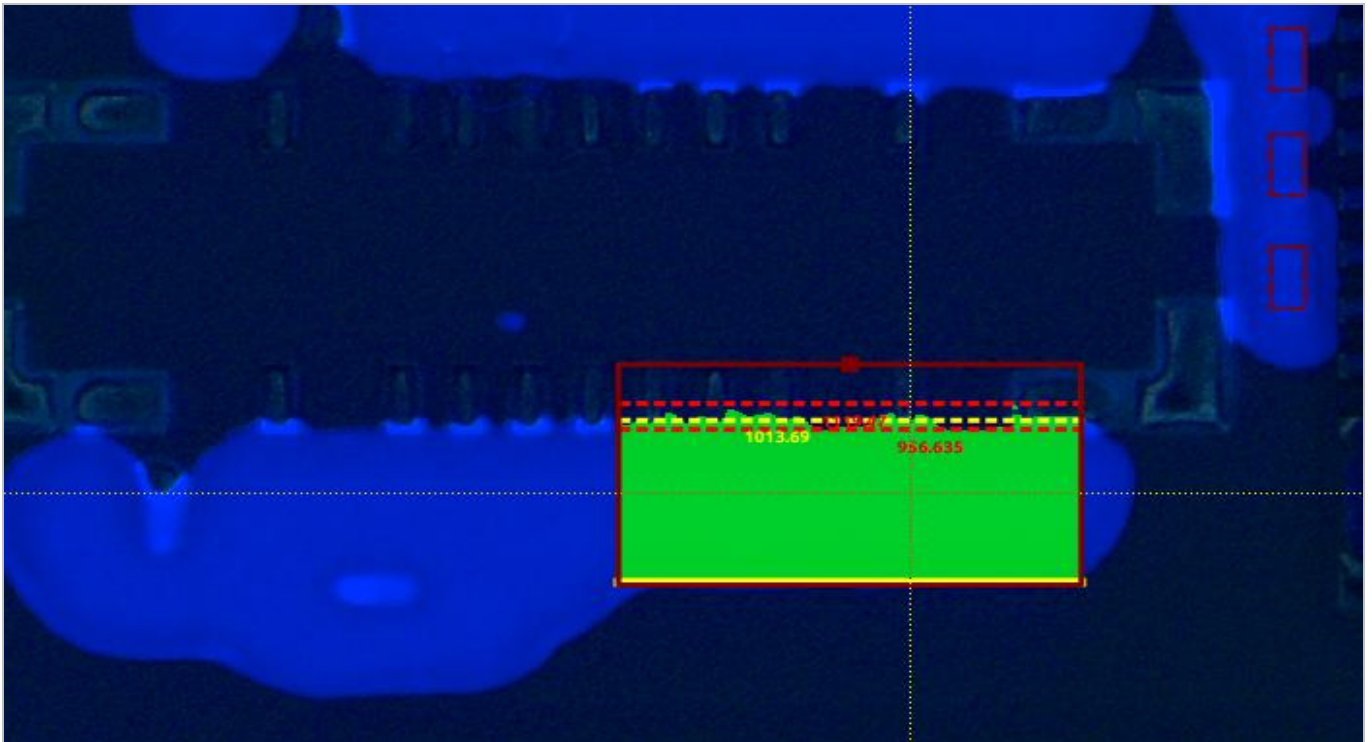

Bubbles inspection

Automatically identify bubble defects in the area to be tested, and visualize the bubble value.
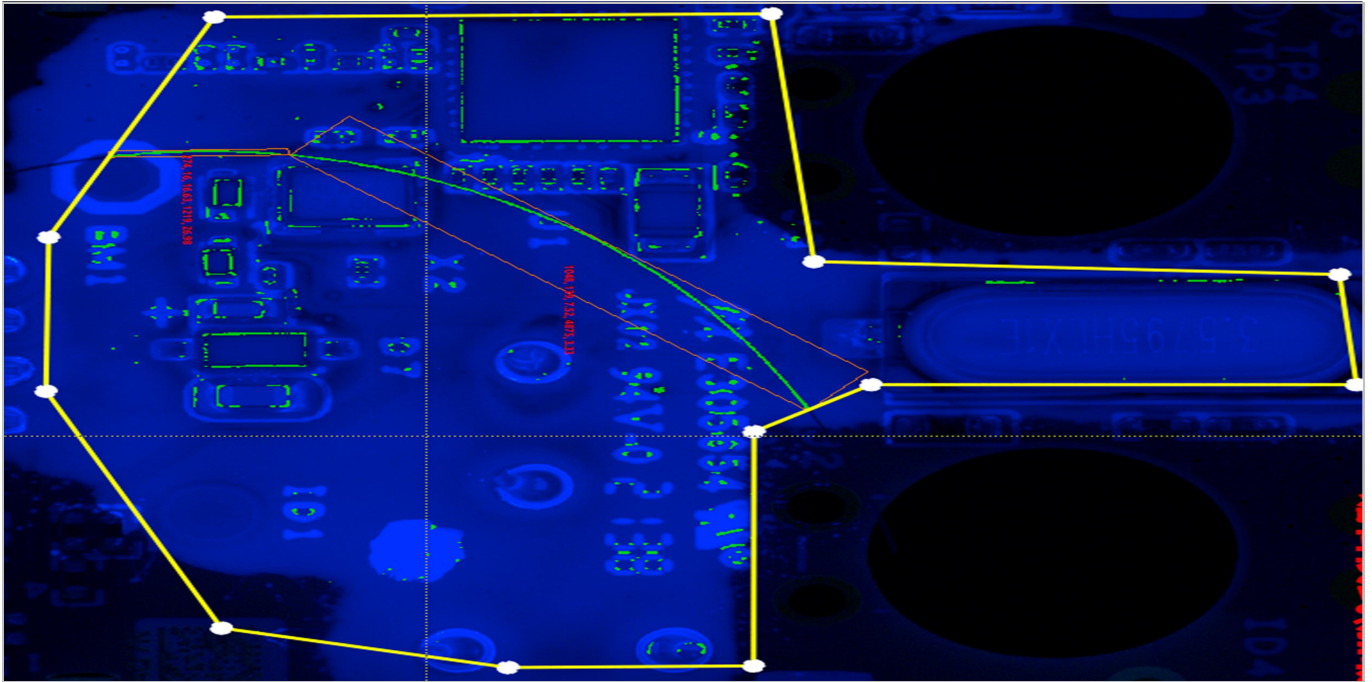
Scatter/Foreign Object Inspection

Dedicated scatter foreign object detection algorithm, intelligently identify scattered points or foreign objects (such as hair strands) in the area to be measured, without personnel debugging.
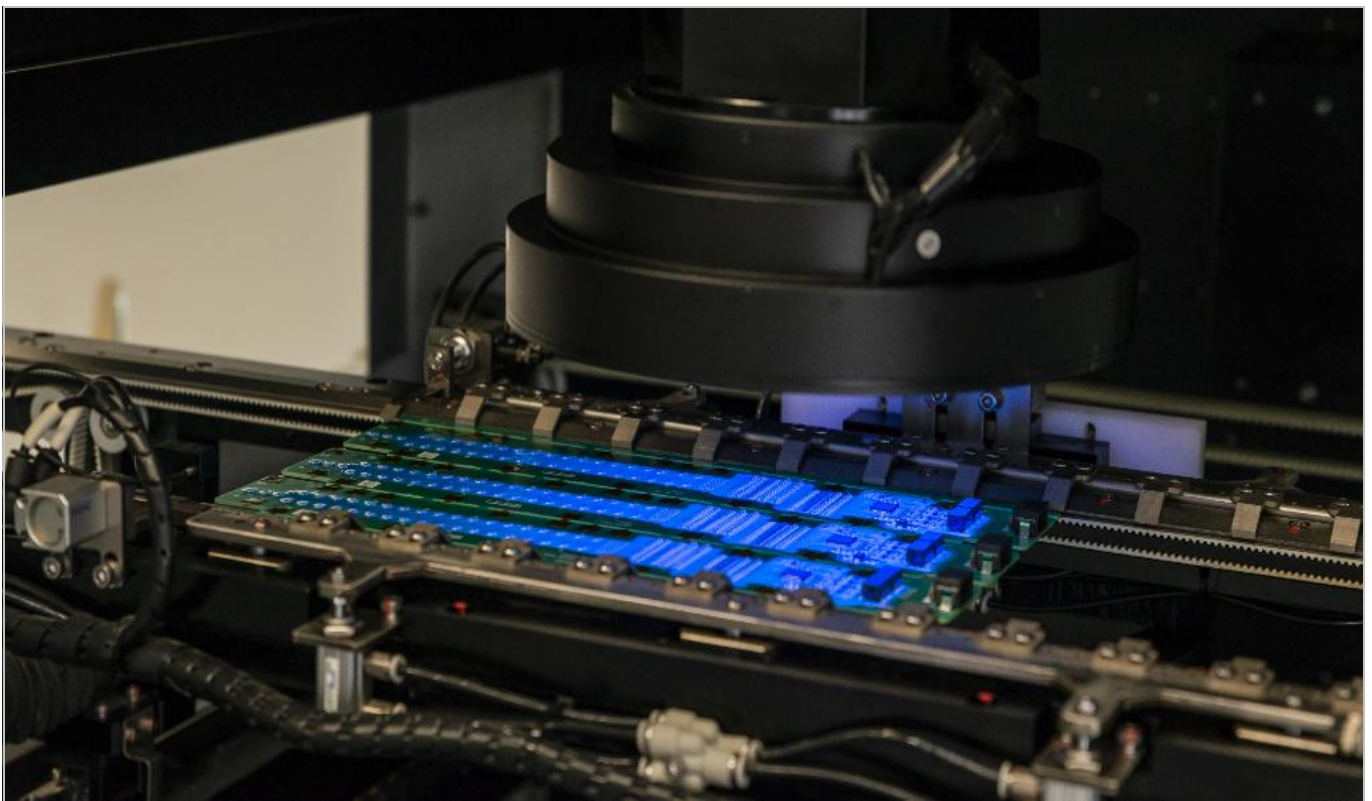

Glue width inspection

Output multiple width values (such as average, minimum, maximum) to standardize coating inspection.

(涂覆胶高度热力图)
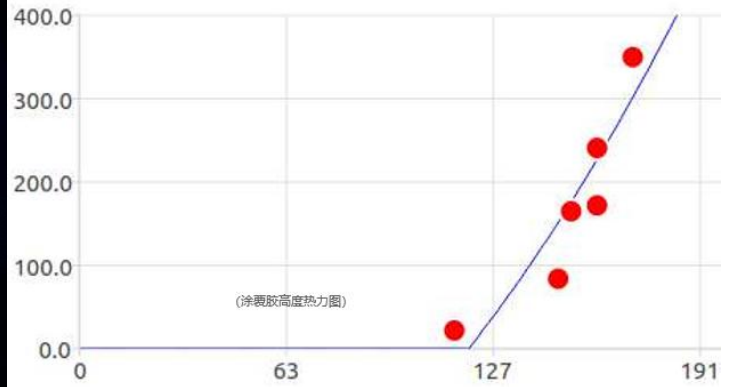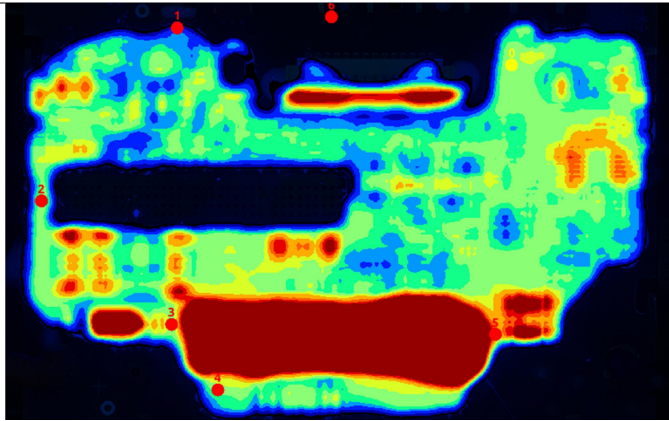
Glue thickness inspection

Realize the flatness and thickness detection of the whole board; output the thickness value of a certain point to visualize the data.


Multiple Inspection Modes

1. Support multi-in-1 board inspection, Support mixed board inspection, Support mixed material inspection.

2. Support rotation identification of multiple angles and multiple positions.

3. Support Bad Mark skip.
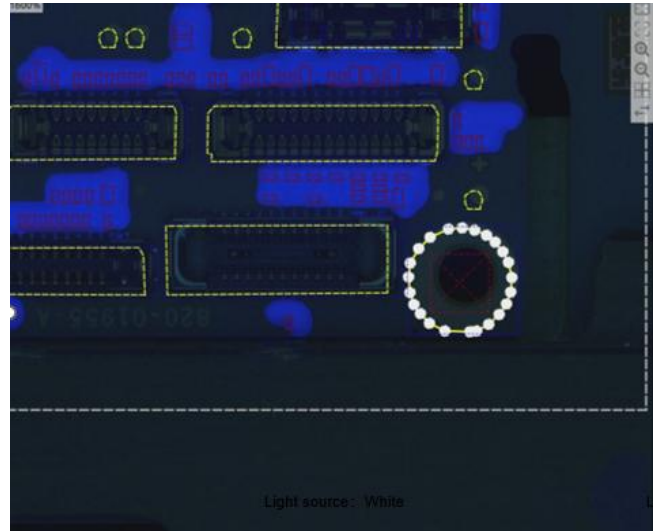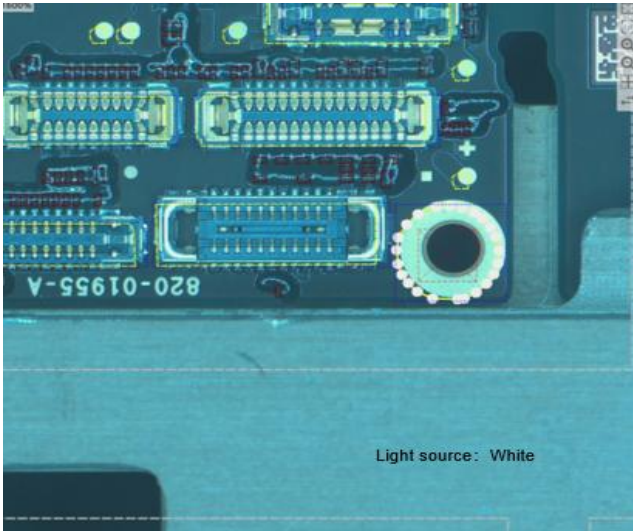
Configurations are optional to achieve more scene applications(Coating, SMT, DIP)

1. Automatically switch the light source, and detect plug-in, patch, solder defects at the same time.

2. Optional full-page, double-sided and other multi-configuration models detection.
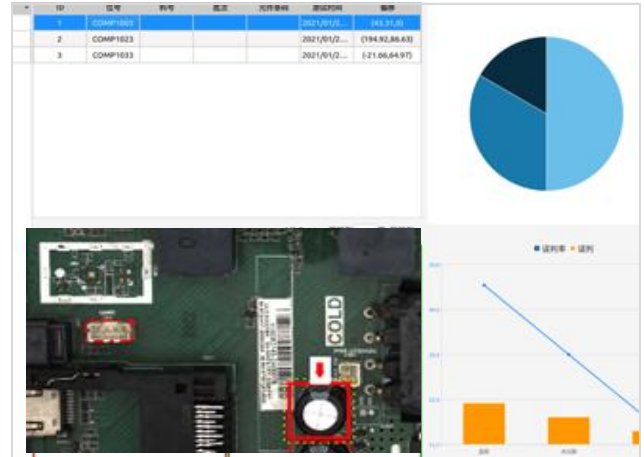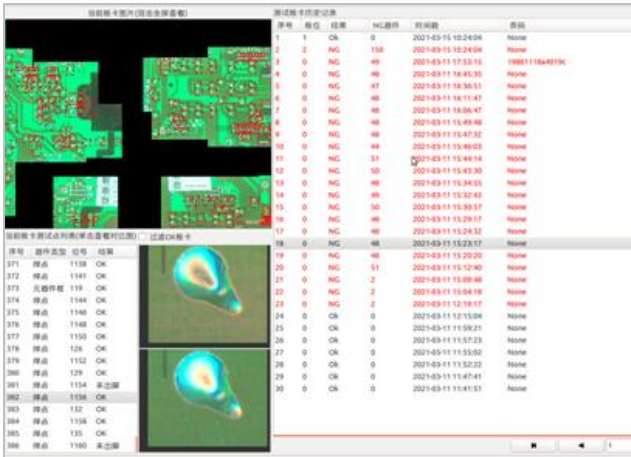
MES System Data Report

1. Camera automatically reads code (bar code and QR code).

2. Complete data, including overall statistic data and all inspection information of each board inspected.

3. Support one-key export, which is convenient for traceback. Data can be effectively applied in MES system.

**Centralized Management and flexible Service**

1. Support remote programming, debugging and management. Save changeover time. Support one-to-many judgment.

2. Remote regulation, centralized management. Reduce suspension of work. Enhance production efficiency.

3. Remote off-line programming, which will not affected inspection.

4. Remote support. Quick response and maintenance.

Specification:

Model	I.C.T Coating Online AOI AI-5146C	I.C.T Coating Online AOI AI-5146CW
FOV	15um@36*30mm (standard)	21.5um@52.6*44mm (standard)
Camera	Single side camera 5M	Dual side camera 5M
Light	UV + W light, (UV + RGBW)	
Inspection Speed	0.23sec/FOV	
Inspection Algorithm	CNN, Color contrast, Outline recognition, Offset inspection, Template matching, Character comparison, OCR, etc.	
Inspection Item	Coating: UV glue, UF glue, Excessive, Insufficient, Air bladder, Foreign material, Bubble, Splashing. Component: Absent, Reversed, Mis-alignment, Broken, Extra, Foreign matter Stained, etc. for THT and SMD. Solder: Insufficient Excessive Bridge, No foot, Solder void etc. Other: Bar code Recognition / QR code Recognition/ OCR.	
Mixing PCB Inspection	Support calling program automatically.	
PCB Size	50*50mm~510*460mm	50*50mm~510*460mm Large board mode: 730*460mm
PCB Height	Top: 25mm, Bottom: 80mm	Top: 75mm, Bottom: 75mm
PCB Thickness	0.5~6.0mm	
PCB Edge	3.0mm	
PCB Warpage	±3.0mm	
PCB Weight	Max: 10Kg	
Conveyor Height	900±20mm	
With Adjustment	Manual / Auto	
Conveyor Direction	L ~R or R ~L	
Motion Driver	AC servo driver + Ballscrew, repeat accuracy 0.01mm	
Operation System	Ubuntu 18.04 LTS 64bit Remote control, remote assistance, CAD file import and user-defined model training	
PC	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 32G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	CPU: Intel i5 Display card: NVIDIA GTX1050Ti Memory: 64G DDR, 240G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
Display	23.8 inch FHD display	
Data Output	Autogenerated statistic analysis SPC	
Special Function	Automatic search of elements and quick programming	
Power	AC220 50/60Hz,5A	
Rated Power	380W	570W
Compressed Air	0.4~0.6Mpa	

Communication	SMEMA	
Weight	750Kg	860Kg
Dimension	L990*W1085*H1540mm	L1050*W1335*H1650mm

Dimension:
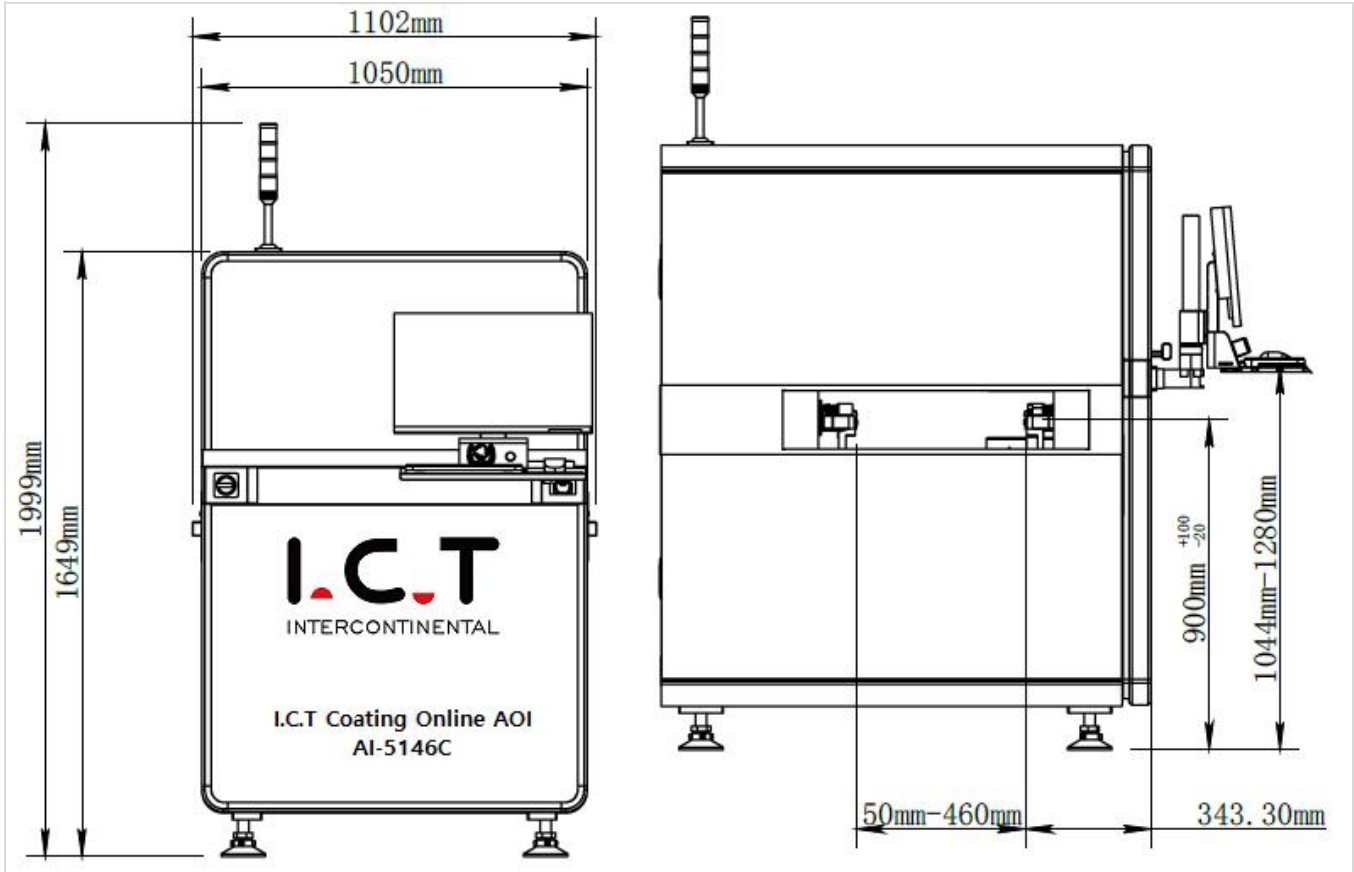
* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.

Thanks for choosing I.C.T.

I.C.T looks forward to win-win cooperation.

Thank you.