MAKΣR-RAY

AI Empowers AOI

Upholding the mission of "Make Industrial Inspection Easier", taking deep learning algorithm as the core, MAKER-RAY has been specializing in the electronics industry for many years and is committed to providing customers with various optical testing solutions based on the visual inspection standardization scheme of the PCBA production process.

Products layout

SMT Line

SMD/solder 3D inspection	Dual side inspection
SMD/solder 2D inspection	Solder paste inspection

DIP Line

|	
DIP component inspection	Solder joint inspection
Bended foot inspection	Dual side inspection

Coating Line

Single side coating inspection

Dual side coating inspection

Future planning

Goldfinger inspection	Semiconductor inspection
Mini LED inspection	…

Core Technology

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

input
32X32

C_1 feature maps
28X28

S_1 feature maps
14X14

C_2 feature maps
10X10

S_2 feature maps
5X5

n_1

n_2 output

5X5 convolution

2X2 subsampling

5X5 convolution

2X2 subsampling

fully connected

feature extraction

classification
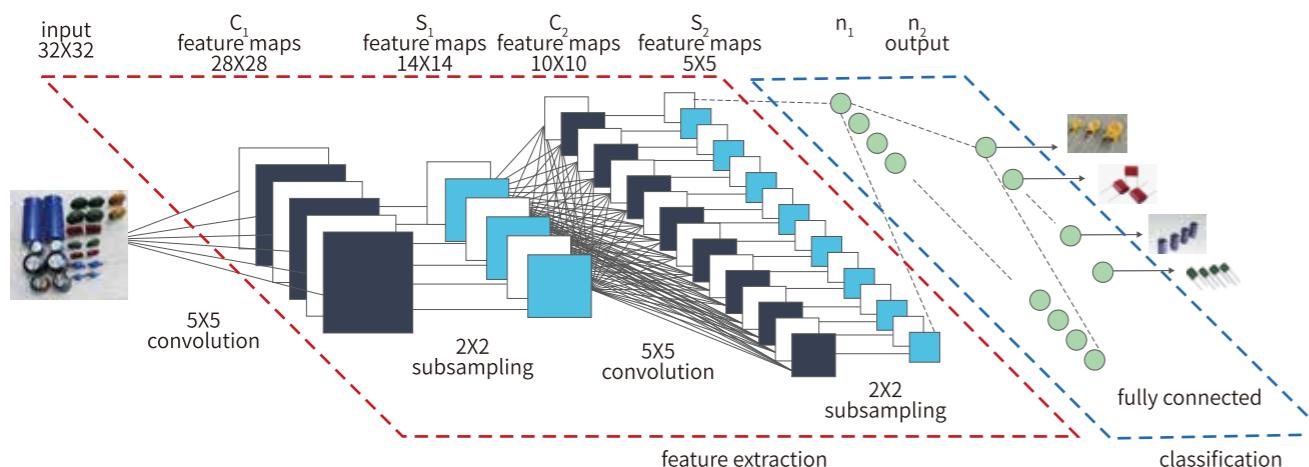
Strong Technology Accumulation

MAKER-RAY has obtained multiple certifications, including 77 patents and copyright, among which more than half are invention. All our products are protected with intellectual property rights.

Statistics end as of Jan. 21st, 2021

AIS20X Series-DIP
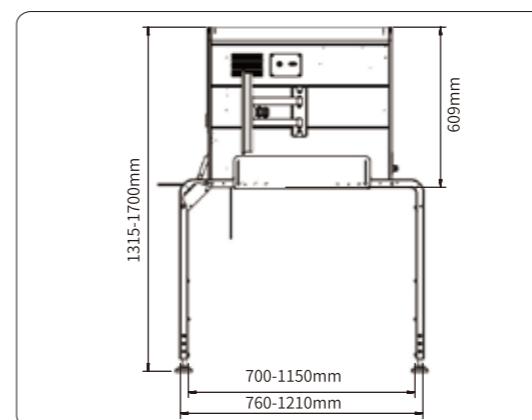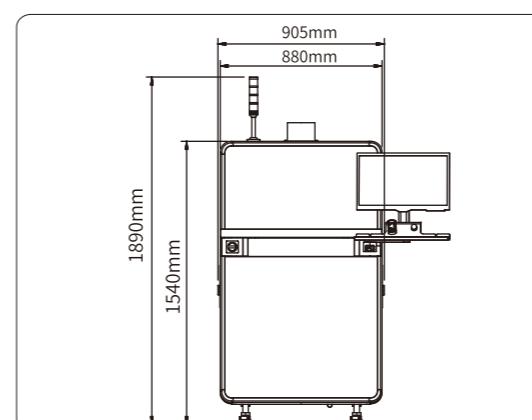
**Online PCBA AOI For DIP Components
To inspect defects of DIP components**

Core Advantages
· Simple programming, easily operation, support online/offline programming
· Multiple inspection modes, adapt diversity of production
· Detailed data test report , support SPC alarm
· Multiple selectable options realize locate defects quickly and production line control

· AIS203

1315-1700mm
609mm
700-1150mm
760-1210mm

715mm
550mm
679mm

· AIS203-R | Provided with rail

905mm
880mm
1890mm
1540mm

1140mm
750 +100mm/-20mm
50-460mm 313mm
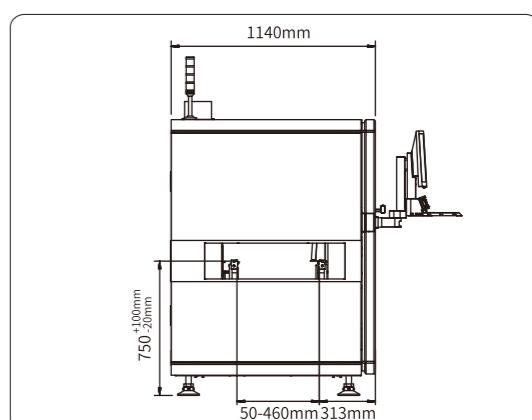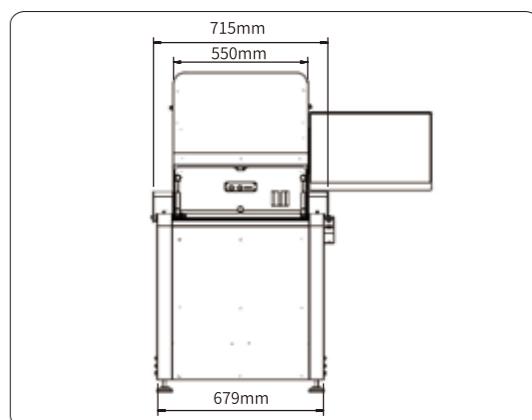
· **AIS203-R** | Provided with rail（With jig backflow conveyor hole ）

880mm
2040mm
1690mm

1140mm
900±20mm
50-460mm   313mm
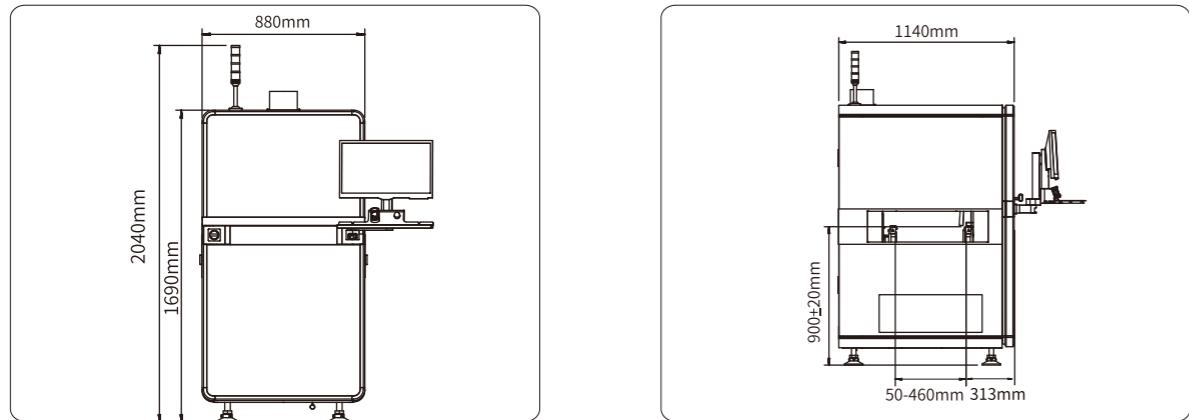
· **Application** | Before/After Wave Soldering

· **Defect Types**

Wrong	Reversed	Absent	Mis-alignment	Extra

不良样本
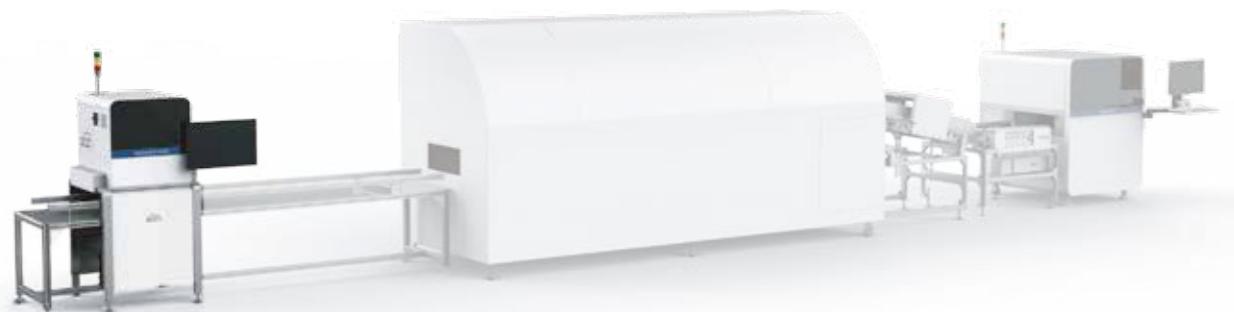
· **Production Line Control Box**

· Automatically/manually control start/stop and positive/inverse of conveyor belt line for ensuring the defectives to be maintained in time.

· Make alarm for the abnormal inspection.

· Reserve a set of interactive interfaces, which can be designed according to site demand

· Easy to be installed due to its small size

· **Specification**

| Category	Item	AIS203-12C	AIS203-29C	AIS203-R
PCBA specification	Size	50*50~400*300mm	50*50~520*380mm	50*50~510*460mm (Height of rail: 750mm/900mm)
	Height of elements	/		TOP:95mm, BOT:95mm
	Processing edge	/		3mm
	Thickness	0.5mm~6mm		
Optical specification	Camera	12MP, color	29MP, color	29MP/12MP, color
	Light source	W light source	W + strip light source on four sides	W + strip light source on four sides/W light source
	FOV	400*300mm	520*380mm	510*460mm/400*300mm
	Resolution ratio	90um	80um	77um/90um
Inspection-related function	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter，stained, etc.		
	Other function	NG tracking bar(optional),control box(optional),mixed material inspection,multi-in-1 inspection, voicebroadcast，After oven mode；Mixing models inspection,support calling program automatically		
	Algorithm	CNN, color contrast, template matching, OCR ,etc.		
Software system	Operating system	Ubuntu 18.04 LTS 64bit		
	Function	Remote control, remote assistance, CAD file import and user-defined model training		
	Communication method	Standard SMEMA interface		
	Data output	Autogenerated statistic analysis SPC		
	Special function	Automatic search of elements and quick programming		
Hardware specification	Industrial control host	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	CPU: intel i7 Display card: Nvida Independent GPU Accelerator Card Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
	Display	23.8 inch FHD display		
	Motion mechanism	/		High precision lead screw + motor
	Rail width control	/		Manual/auto
Appearance/ electric	Dimention and weight	(L*H*W) 715* (1315-1700) * (760-1210) mm，net weight:100Kg		（Rail height：750mm) L*H*W: 880*1540*1140mm；400Kg （Rail height：900mm) L*H*W: 880*1690*1140mm；400Kg
	Power supply and power	AC 220V, rated power 200W		AC 220V, rated power 300W
	Air source	/		0.4-0.6Mpa
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH		

CB101

AIS30X Series-DIP

Inline PCBA AOI for Solder Joint
To inspect defects of solder joint of plug-in components and SMT components on the bottom side

Core Advantages
· Optional three-section track design.
· High speed, high precision and low wear.
· AI algorithm. Quick location and easy programming.
· Strong inspection capability.
· Flexible combination with production line and applicable for multiple scenarios.
· Traceable data and support SPC alarm.
· Automatic cleaning function for lens.

· AIS301
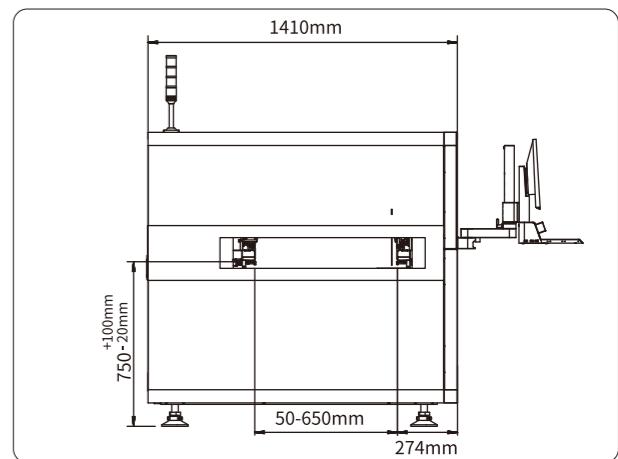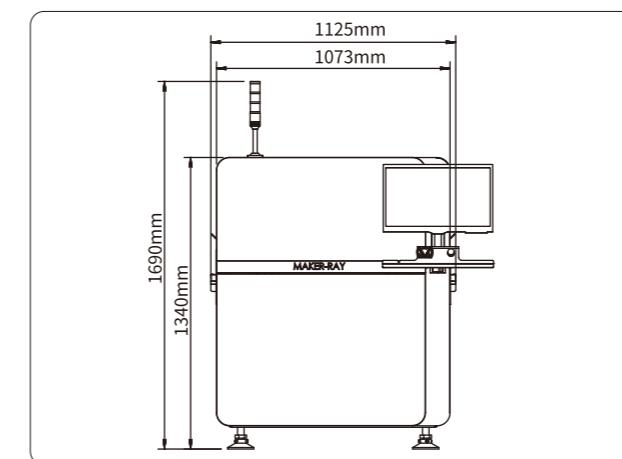
· AIS303


· AIS303-L

· Application | After wave-soldering
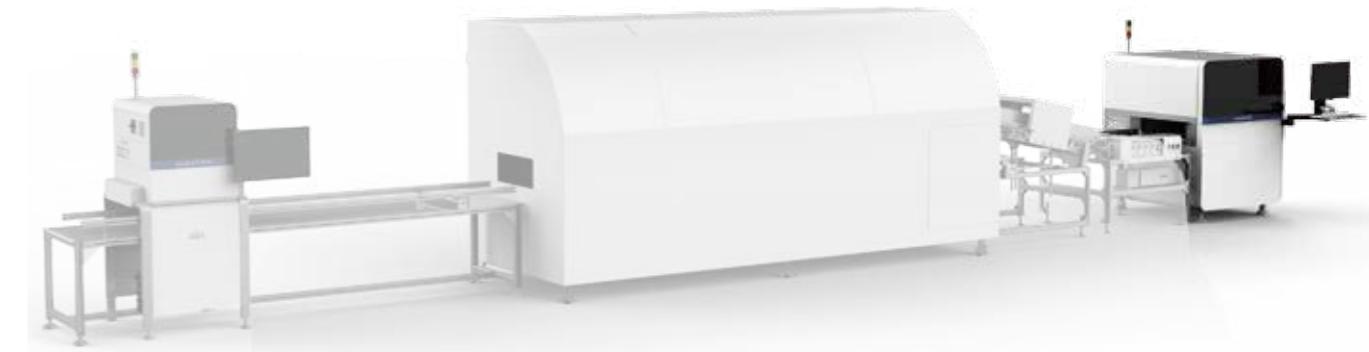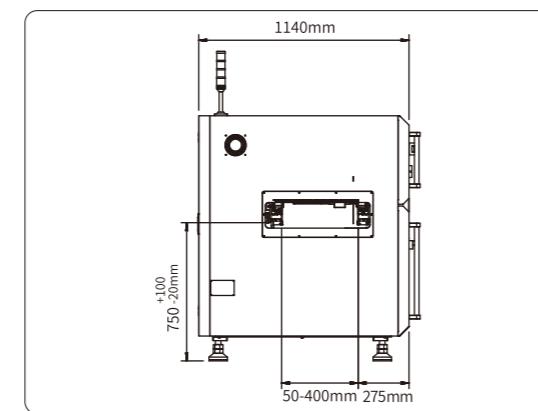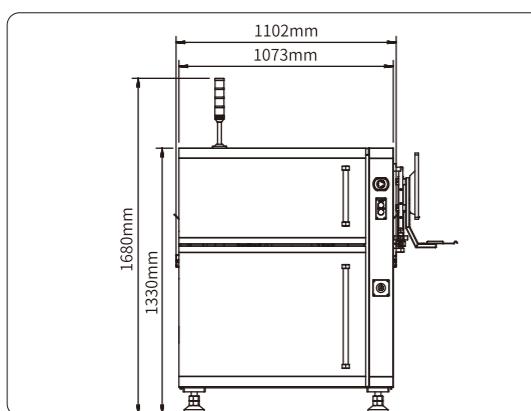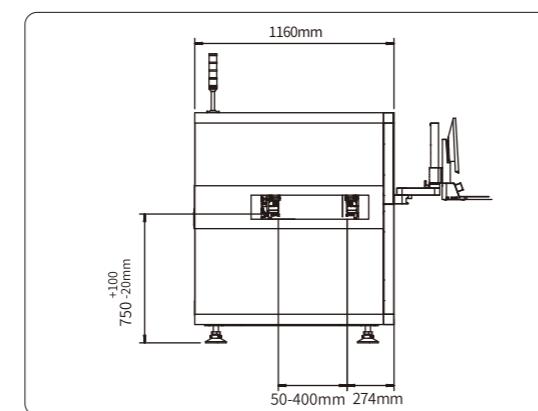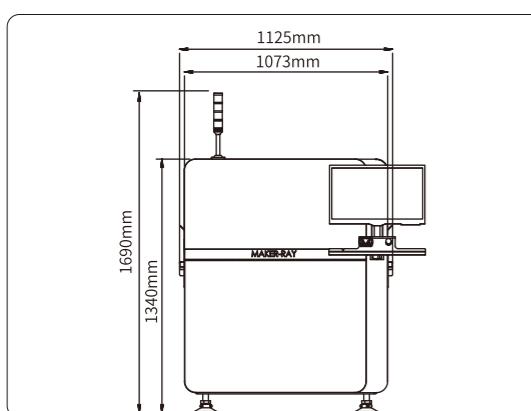
· Defect Type

Good	Insufficient	Excessive	Bridge	No foot	Missing	Pseudo

· Specification

Category	Item	AIS301	AIS303	AIS303-L
PCBA specification	Size	three-section track：50*50~350*400mm signle-section track：50*50~450*400mm		50*50~550*650mm (Large board mode：max 710*650mm)
	Thickness	0.5mm~6mm		
	Height of elements	TOP:150mm, BOT:25mm		
	Processing edge	3mm		
Optical specification	Camera	5MP，color		
	Light source	RGB tricolor ring LED light source	RGB＋W four color integral light source	RGB＋W four color integral light source
	FOV	20um@49*41mm，17um@40.8mm*34mm		
	Resolution	20μm，17um		
Inspection-related function	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter，stained, etc.		
	Solder	Insufficient,excessive,bridge, no foot, solder void,etc.		
	Other function	Bar code Recognition / QR code Recognition/ OCR		
	Mixing boards inspection	Yes,Support calling program automatically		
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, character comparison, OCR ,etc.		
	Speed	0.23sec/FOV		
Software system	Operating system	Ubuntu 14.04 LTS 64bit	Ubuntu 18.04 LTS 64bit	Ubuntu 18.04 LTS 64bit
	Function	Remote control, remote assistance, CAD file import and user-defined model training		
	Communication method	Standard SMEMA interface		
	Data output	Autogenerated statistic analysis SPC		
	Special function	Automatic search of elements and quick programming		
Hardware specification	Industrial control host	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 32G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card		
	Display	22 inch FHD display	23.8 inch FHD display	23.8 inch FHD display
	Rail width control	High precision lead screw + servo motor		
	Rail width control	Manual/auto		
Appearance/ electric	Dimention and weight	（L*H*W)990*1540*1370mm， net weight:790Kg	(L*H*W)990*1540*1085mm， net weight:750Kg	(L*H*W)990*1540*1370mm， net weight:790Kg
	Power supply and power	AC 220V, rated power 380W		
	Air source	0.4-0.6Mpa		
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH		

· Repair Station with Cursor, locating defects quickly

· Off-line/On-line option

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

· Whole board projection guide maintenance personnel to repair quickly

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

· Multiple guide colors for selection. Avoid interference by board color

· Guide by areas. Higher efficiency

No.	Item	Offline repair station	Online repair station
1	Model	MKR-AOI-OFFLR101	MKR-AOI-ONLR101
2	PCB Size	550mm*380mm (Max 550mm*420mm)	550mm*400mm
3	PCB thickness	Less than 100mm	
4	Host	CPU:intel i3 Memory:8G DDR4 128G SSD Display:23.8寸 FHD Monitor Operating system:Ubuntu 18.04 LTS 64bit	
5	Overall dimension	（L*H*W) 550*830*760mm	(L*H*W) 900*1550*1100mm
6	Power supply	Single phase AC220V,50/60Hz	
7	Platform	Aluminium section frame + SECC matal plate	
8	Mouse and keyboard	Chocolate keyboard + Logitech mouse	
9	Foot plate	Metal USB foot switch	
10	Micro switch	Omron micro switch	
11	Conveyor	/	Mannual width-controlled conveyor with the plate loading height of 750mm (the height could be customized)
12	Free accessories	Soldering tin support and universal code scanner support	
13	Paid accessories	Code scanner (USB data interface) and electric soldering iron	
14	Rated (Max) power consumption	1220W	
15	average consumption	55W	

AIS40X Series-SMT
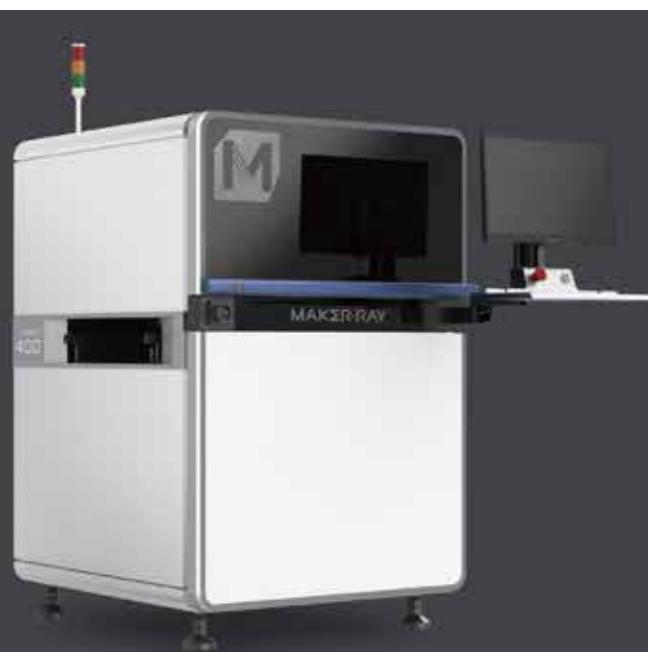
Inline PCBA AOI for SMT Components（2D）
To inspect defects of SMT components and solder

Core Advantages
· Bilateral telecentric lens, low distortion and high depth of field
· Minimalist programming , simple interface. Support batch modifying parameters with one-click
· Centralized control. Interconnection between multiple equipment
· High inspection rate and low false alarm rate
· Multiple configurations meet different inspection demands
· Traceable data and support SPC alarm

· Industry 4.0 centralized management

Centralized management, Remote service
Networked distributed production equipment
Quick response, reduce disruption, improve efficiency

A Plant
B Plant
C Plant

4.0
Industry 4.0 centralized management

Remote debug
Remote control
Remote support
Centralized management

... ...

· Application ｜ Before/after reflow

· AIS401

1050mm
990mm
1890mm
1540mm

1085mm
900±20mm
50-460mm 275mm

· AIS400-D/401-D ｜ Dual rail

1015mm
990mm
1890mm
1540mm

1370mm
900±20mm
330mm 268mm
330mm 653mm

· Defect Type

Offset	Wrong Reversed	Absent	Stained	Exposed	copper

· Specification

AIS50X Series-Multi
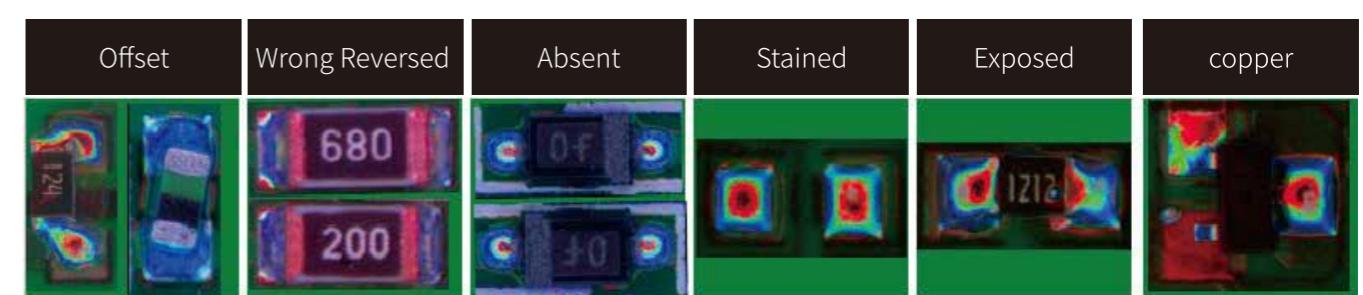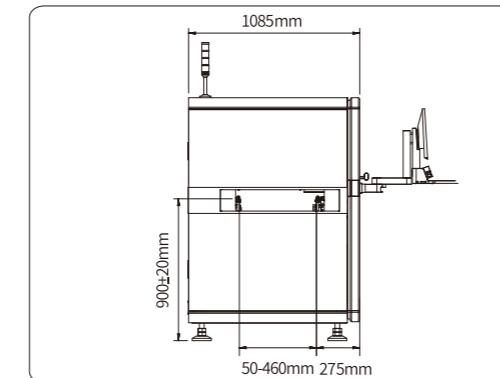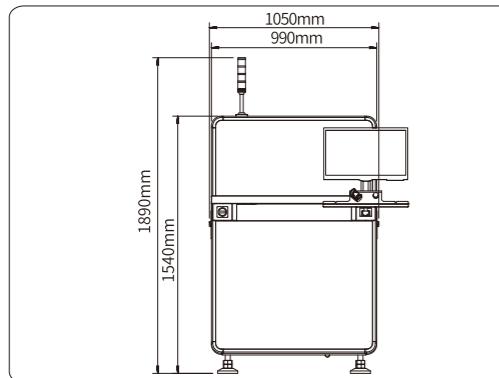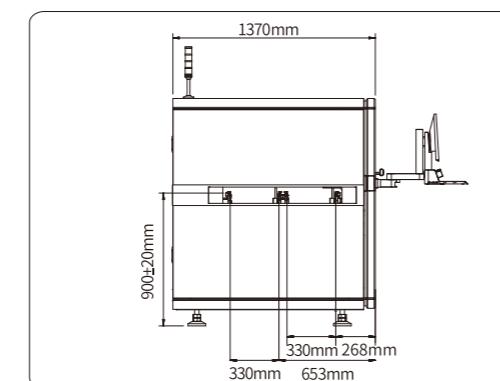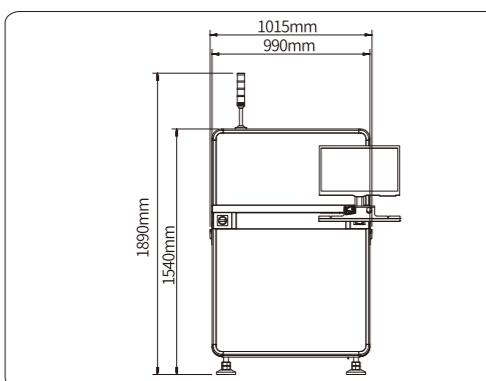
| Category	Item	AIS400	AIS401	AIS400-D (3adjustable rails) / AIS401-D (4adjustable rails)
PCBA specification	Size	50x50mm~510*460mm	50x50mm~510*460mm (Large board mode: Left to right: max730*460mm Right to left: max640*460mm)	50x50mm~510*610mm (single rail operation) 50x50mm~510*330mm (Dual rail operation)
	Thickness	0.5mm-6mm		
	Height of elements	Top:25mm, Bottom: 80mm	Top:25mm, Bottom: 80mm	Top:25mm, Bottom: 30mm
	Processing edge	3mm		
Optical specification	Camera	5MP/12MP, color		
	Optical source	RGB + W four color integral light source		
	FOV	15um@36*30mm, 10um@24*20mm / 15um@45*45mm, 10um@40*30mm,		
	Resolution ratio	15um, 10um		
Inspection-related function	Components	Absent, reversed, mis-alignment, broken, extra, foreign matter, stained, etc.		
	Solder	Insufficient, excessive, bridge, no foot, solder void, etc.		
	Other function	Bar code Recognition / QR code Recognition/ OCR		
	Mixing boards inspection	Yes, Support calling program automatically		
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, character comparison, OCR ,etc.		
	Speed	0.23sec/FOV		
Software system	Operating system	Ubuntu 18.04 LTS 64bit		
	Function	Remote control, remote assistance, CAD file import and user-defined model training		
	Communication method	Standard SMEMA interface		
	Data output	Autogenerated statistic analysis SPC		
	Special function	Automatic search of elements and quick programming		
Hardware specification	Industrial control host	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 32G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card		
	Display	22 inch FHD display	23.8 inch FHD display	23.8 inch FHD display
	Motion mechanism	High precision lead screw + servo motor		
	Rail width control	Manual/auto		
Appearance/ electric	Power suppl and power	(L*H*W) 990*1540*1370, net weight:790Kg	(L*H*W) 990*1540*1085, net weight:750Kg	(L*H*W) 990*1540*1370, net weight:790Kg
	Power supply and power	AC 220V, rated power 380W		
	Air source	0.4-0.6Mpa		
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH		

Inline PCBA AOI for Double side
To inspect defects of components and solder for double side

Core Advantages

· Asynchronously photograph with double cameras to avoid interference of light source and raise inspection beat.
· Minimalist programming , simple interface. Support parameters batch modification
· High inspection rate and low false alarm rate
· Centralized control and multiple equipment interconnection
· Able to inspect defects of SMD/DIP/solder, applicable for multiple scenarios
· Traceable data and support SPC alarm

· AIS501
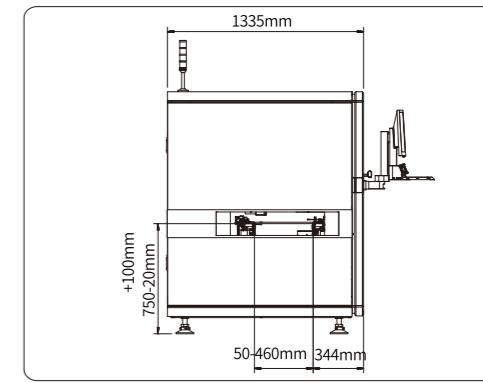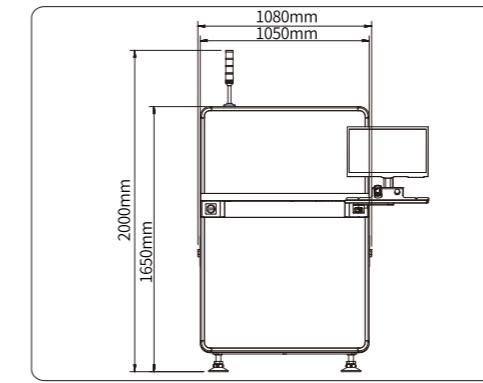
· AIS501-L
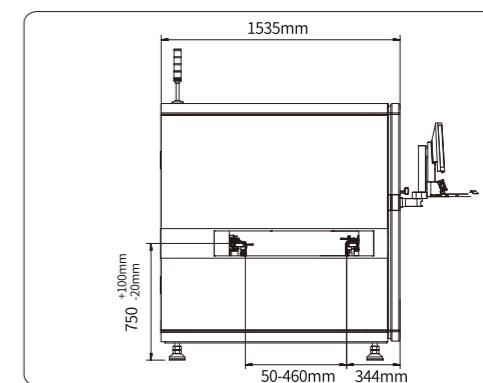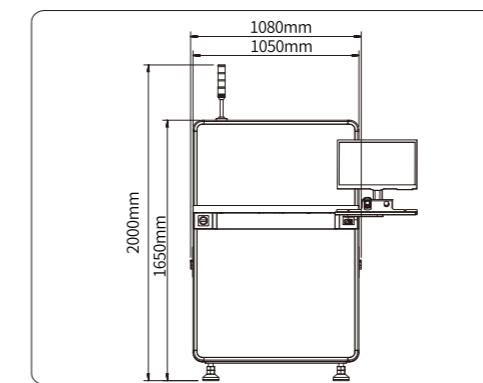
· Application | After reflow/wave-solder and before package

· Defect Type

Good	Insufficient	Excessive	Bridge	No foot	Missing	Pseudo

Offset	Wrong Reversed	Absent	Stained	Exposed	copper

Wrong	Reversed	Absent	Mis-alignment	Extra
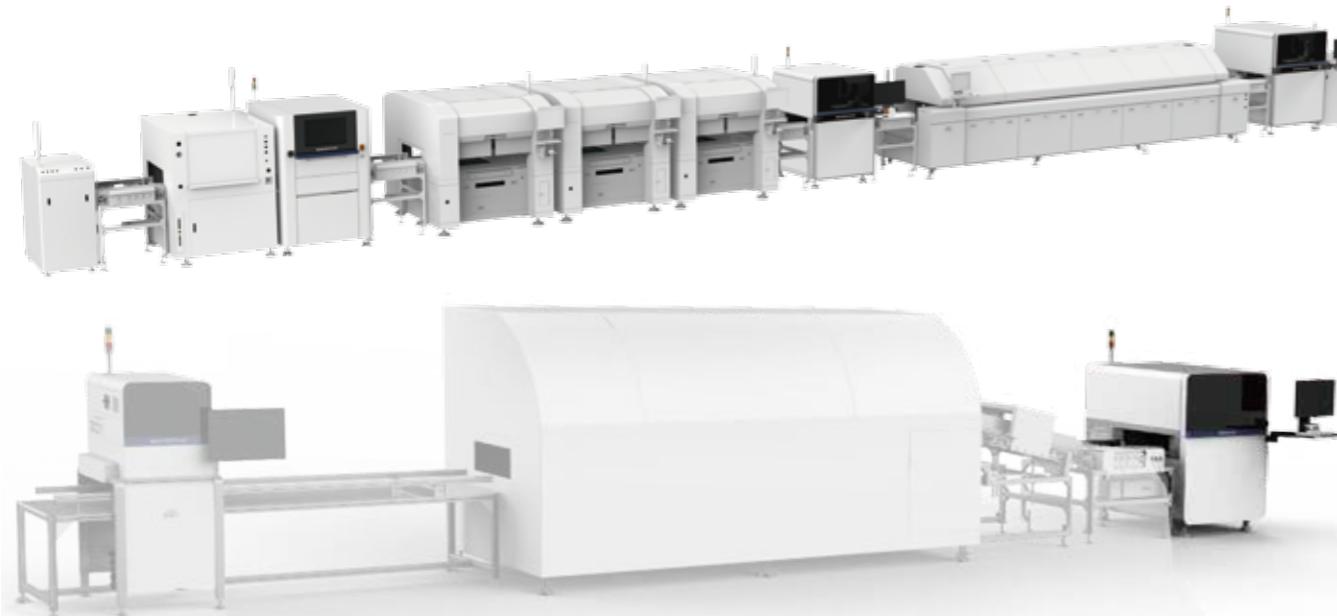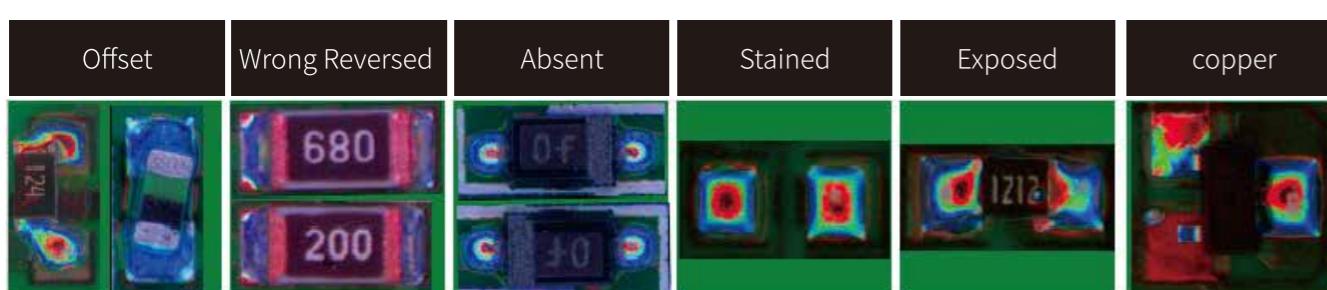
· Specification

| Category	Item	AIS501	AIS501-L
PCBA specification	Size	50x50mm~510*460mm (Large board mode：max730*460mm)	50x50mm~510*650mm (Large board mode：max730*650mm)
	Thickness	0.5mm-6mm	
	Height of elements	Top:75mm, Bottom: 75mm	
	Processing edge	3mm	
Optical specification	Camera	Upper camera: 5MP/12MP，color / Lower camera: 5MP/12MP，color	
	Optical source	RGB + W four color integral light source	
	FOV	21.5um@52.6*44mm，15um@36*30mm/10um@30*40mm，15um@60*40mm	
	Resolution ratio	21.5μm/15um/10um	
Inspection-related function	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter，stained, etc.	
	Solder	Insufficient,excessive,bridge, no foot, solder void,etc.	
	Other function	Bar code Recognition / QR code Recognition/ OCR	
	Mixing boards inspection	Yes,Support calling program automatically	
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, character comparison, OCR ,etc.	
	Speed	0.23sec/FOV	
Software system	Operating system	Ubuntu 18.04 LTS 64bit	
	Function	Remote control, remote assistance, CAD file import and user-defined model training	
	Communication method	Standard SMEMA interface	
	Data output	Autogenerated statistic analysis SPC	
	Special function	Automatic search of elements and quick programming	
Hardware specification	Industrial control host	CPU: intel i7 / Display card: Nvida Independent GPU Accelerator Card / Memory: 64G DDR, 256G SSD+2T Mechanical Hard Disk / Network: 1000M Wired Network Card	
	Display	23.8 inch FHD display	
	Motion mechanism	High precision lead screw + servo motor	
	Rail width control	Manual/auto	
	Transmission type	Chain / Belt	Chain / Belt
	Rail payload	≤10KG / ≤4KG	≤10KG / ≤4KG
Appearance/ electric	Dimention and weight	（L*H*W) 1050*1650*1335, net weight:860Kg	（L*H*W) 1050*1650*1535, net weight:100Kg
	Power supply and power	AC 220V, rated power 570W	
	Air source	0.4-0.6Mpa	
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH	

AIS-Coating

Inline PCBA AOI For Coating
To inspect defects of coating, such as excessive, insufficient, splash, bubble etc.

Core Advantages
· Intelligently lock coating border,Automatically identify coating area
· Intelligently judge bubble of targeted area. Minimum bubble diameter is up to 0.05mm
· Able to inspect coating defects. Plug-in defects, SMT defects, soldering defects and other defects can be inspected after switching light source.
· Support multi-in-1 panel inspection, mixed model inspection. Multiple configurations (whole board, double side) are available.
· Traceable data and support SPC alarm
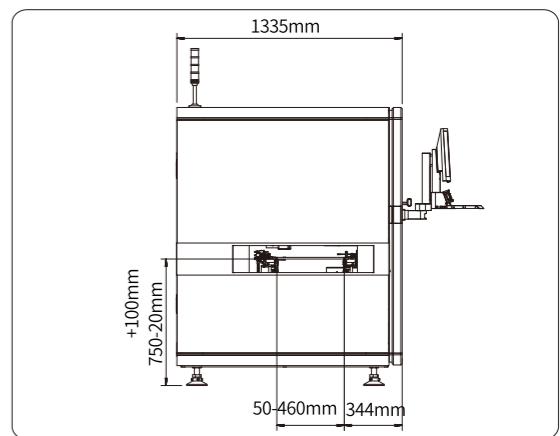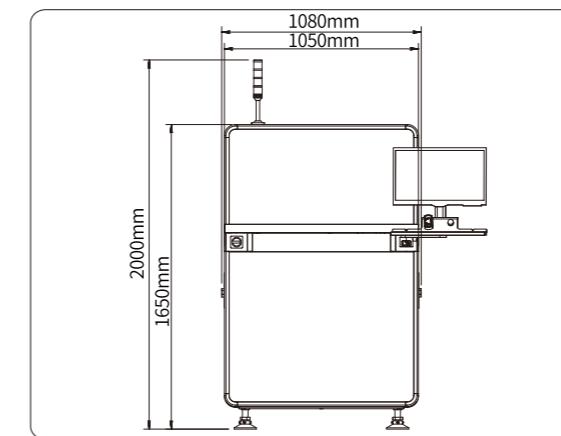
·AIS20XS-C | Single side (Optional rail height 750mm)

880mm
2040mm
1690mm

1140mm
900±20mm
50-460mm 313mm

·AIS40XS-C | Single side

1050mm
990mm
1890mm
1540mm

1085mm
900±20mm
50-460mm 275mm

·AIS50XS-C | Double side

1080mm
1050mm
2000mm
1650mm

1335mm
+100mm
750-20mm
50-460mm 344mm
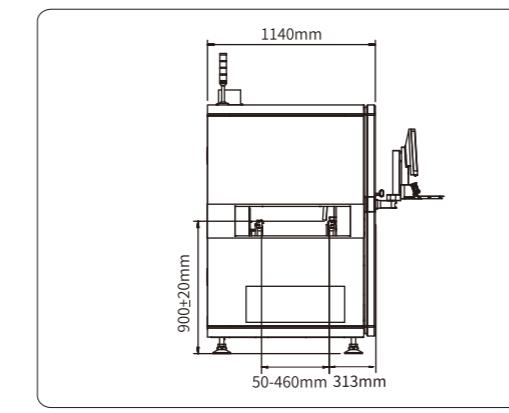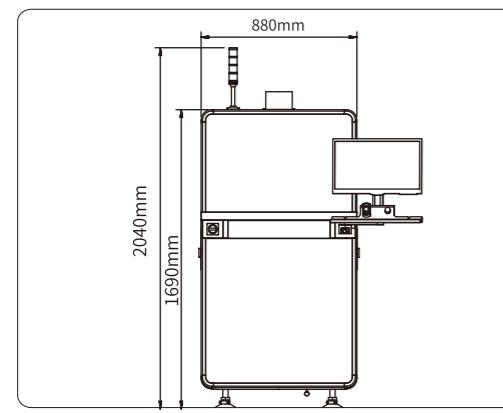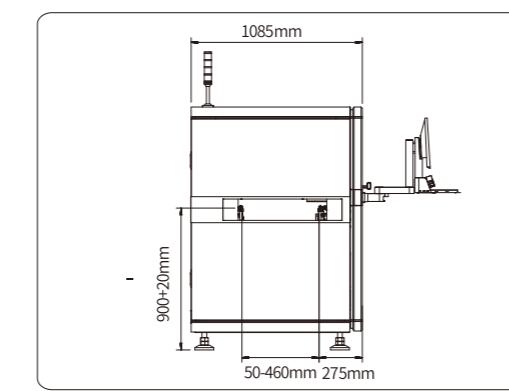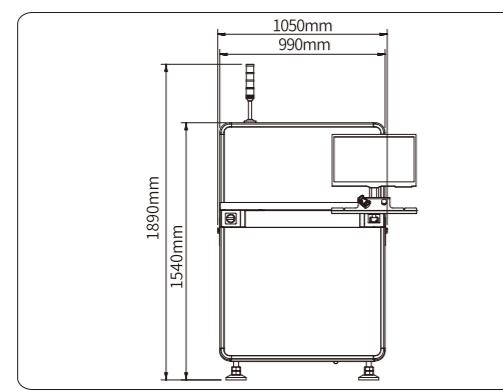
### ·Application | Before/after curing

·Defect Type | Switch light source to inspect*

Coating

| Excess | Insufficient | Splash | Bubble | Smudge |

SMT defects		Plug-in defects		Soldering defects	
Missing	Wrong	Missing	Wrong	Excess	Insufficient
Mis-alignment	Reversed	Mis-alignment	Reversed	No solder	Bridge
Broken	Tombstone	Broken	Extra	No foot	Solder void
Upside-down	Smudge	Bar/QR code	No foot	Pseudo solder	Missing solder

·Specification

Category	Item	AIS203-RC
PCBA specification	Size	50*50~510*460mm(Height of rail: 750mm/900mm)
	Height of elements	TOP:95mm, BOT:95mm
	Processing edge	3mm
	Thickness	0.5mm~6mm
Optical specification	Camera	29MP/12MP, color
	Light source	UV+W
	FOV	510*460mm/400*300mm
	Resolution ratio	77um/90um
Inspection-related function	Coating	Excessive or less UV/UF gel, bubble in UV/UF gel
	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter, stained, etc.
	Solder	/
	Other function	Bar code Recognition / QR code Recognition/ OCR
	Mixing boards inspection	Yes,Support calling program automatically
	Algorithm	CNN, color contrast, template matching, OCR ,etc.
	Speed	/
Software system	Operating system	Ubuntu 18.04 LTS 64bit
	Function	Remote control, remote assistance, CAD file import and user-defined model training
	Communication method	Standard SMEMA interface
	Data output	Autogenerated statistic analysis SPC
	Special function	Automatic search of elements and quick programming
Hardware specification	Industrial control hos	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 8G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
	Display	23.8 inch FHD display
	Motion mechanism	High precision lead screw + motor
	Rail width control	Manual/auto
Appearance/ electric	Dimention and weight	L*H*W: 880*1690*1140mm net weight:400Kg
	Power supply and power	AC 220V, rated power 300W
	Air source	0.4-0.6Mpa
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH

Category	Item	AIS401-C
PCBA specification	Size	50x50~510*460mm Large board mode (Left to right：max730*460mm；Right to left：max640*460mm)
	Thickness	0.5mm-6mm
	Height of elements	Top:25mm, Bottom: 80mm
	Processing edge	3mm
Optical specification	Camera	5MP/12MP, color
	Optical source	UV+W / UV+RGBW
	FOV	15um@36*30mm, 10um@24*20mm / 15um@45*45mm，10um@40*30mm,
	Resolution	15um, 10um
Inspection-related function	Coating	Excessive or less UV/UF gel, bubble in UV/UF gel
	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter, stained, etc.
	Solder	Insufficient,excessive,missing, bridge,solder void,etc.
	Other function	Bar code Recognition / QR code Recognition/ OCR
	Mixing boards inspection	Yes,Support calling program automatically
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, OCR ,etc.
	Speed	0.23sec/FOV
Software system	Operating system	Ubuntu 18.04 LTS 64bit
	Function	Remote control, remote assistance, CAD file import and user-defined model training
	Communication method	Standard SMEMA interface
	Data output	Autogenerated statistic analysis SPC
	Special function	Automatic search of elements and quick programming
Hardware specification	Industrial control host	CPU: intel i5 Display card: Nvida Independent GPU Accelerator Card Memory: 32G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
	Display	23.8 inch FHD display
	Motion mechanism	High precision lead screw + servo motor
	Rail width control	Manual/auto
Appearance/ electric	Dimention and weight	(L*H*W) 990*1540*1085, net weight:750Kg
	Power supply and power	AC 220V, rated power 380W
	Air source	0.4-0.6Mpa
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH

AIS43X Series-3D

| Category	Item	AIS501-C
PCBA specification	Size	50x50mm~510*460mm
	Thickness	0.5mm-6mm
	Height of elements	Top:75mm, Bottom: 75mm
	Processing edge	3mm
Optical specification	Camera	Upper camera: 5MP/12MP，color Lower camera: 5MP/12MP，color
	Optical source	UV+W optical source / UV+RGBW
	FOV	21.5um@52.6*44mm, 15um@36*30mm/10um@30*40mm, 15um@60*40mm
	Resolution ratio	21.5μm/15um/10um
Inspection-related function	Coating	Excessive or less UV/UF gel, bubble in UV/UF gel
	Components	Absent, reversed, mis-alignment, broken, extra,foreign matter, stained, etc.
	Solder	Insufficient,excessive,bridge,, no foot, solder void,etc. (UV+RGBW source)
	Other function	Bar code Recognition / QR code Recognition/ OCR
	Mixing boards inspection	Yes,Support calling program automatically
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, OCR ,etc.
	Speed	0.23sec/FOV
Software system	Operating system	Ubuntu 18.04 LTS 64bit
	Function	Remote control, remote assistance, CAD file import and user-defined model training
	Communication method	Standard SMEMA interface
	Data output	Autogenerated statistic analysis SPC
	Special function	Automatic search of elements and quick programming
Hardware specification	Industrial control host	CPU: intel i7 Display card: Nvida Independent GPU Accelerator Card Memory: 64G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card
	Display	23.8 inch FHD display
	Motion mechanism	High precision lead screw + servo motor
	Rail payload	≤4KG
	Rail width control	Manual/auto
Appearance/ electric	Dimention and weight	(L*H*W) 1050*1650*1335，net weight:860Kg
	Power supply and power	AC 220V, rated power 570W
	Air source	0.4-0.6Mpa
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH

Inline PCBA AOI for SMT Components（3D）
To inspect defects of SMT components and solder
### 3D imaging, minimizing shadow problems

Core Advantages

· Intelligently remove noise with depth map. Solve distortion problem in 3D imaging.

· Measurement height can be configured, meeting a variety of inspection requirements

· Dynamic self-adoption reference plane algorithm to calibrate substrate height

· Multi-frequency four-step phase algorithm to strengthen robustness, avoiding influence of illumination changing imaging

· **AIS430**
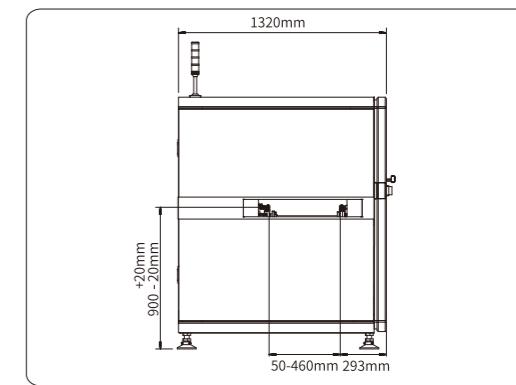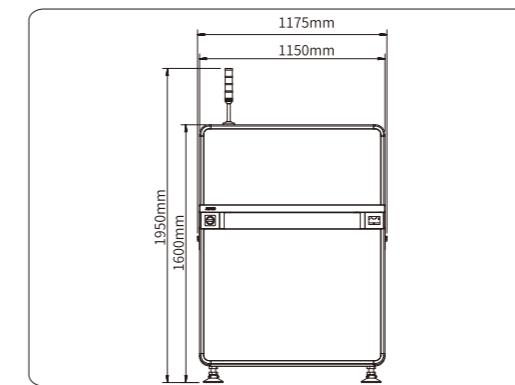
· **AIS431-D | Dual rail**
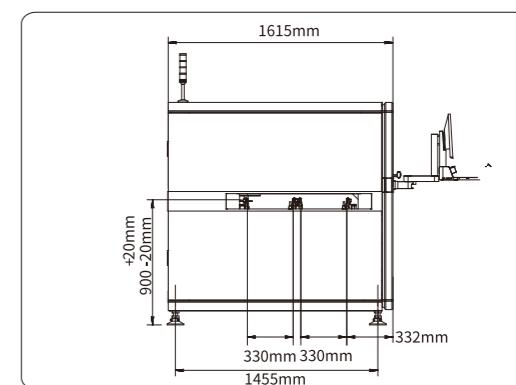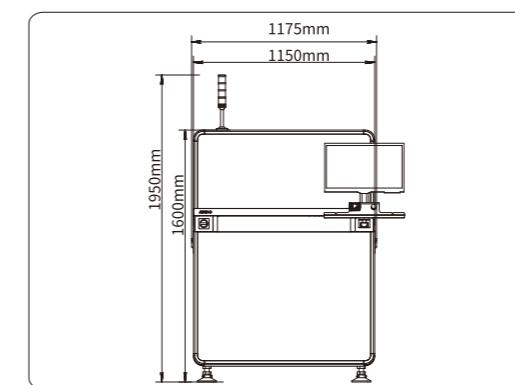
·**Application** | After reflow

·**Defect Type** | SMD

Wrong	Reversed	Float	Silk screen
Tombstone	Absent	Offset	Lifted Lead

·**Defect Type** | Solder

Bridge	Pseudo	Solder ball
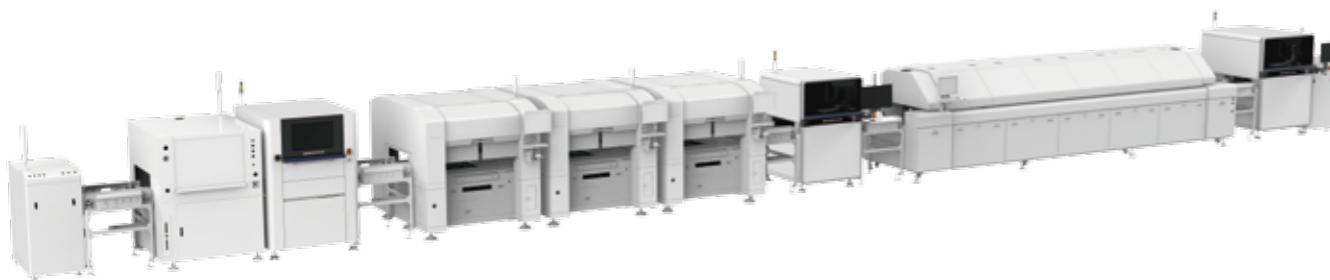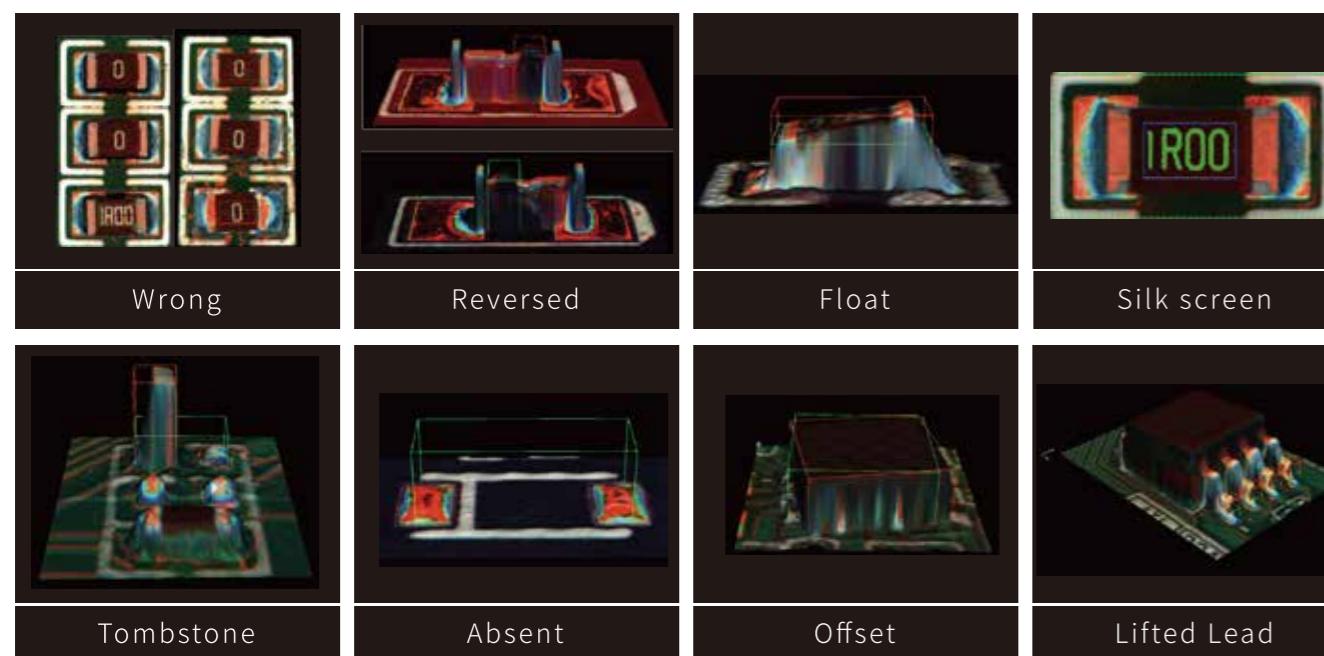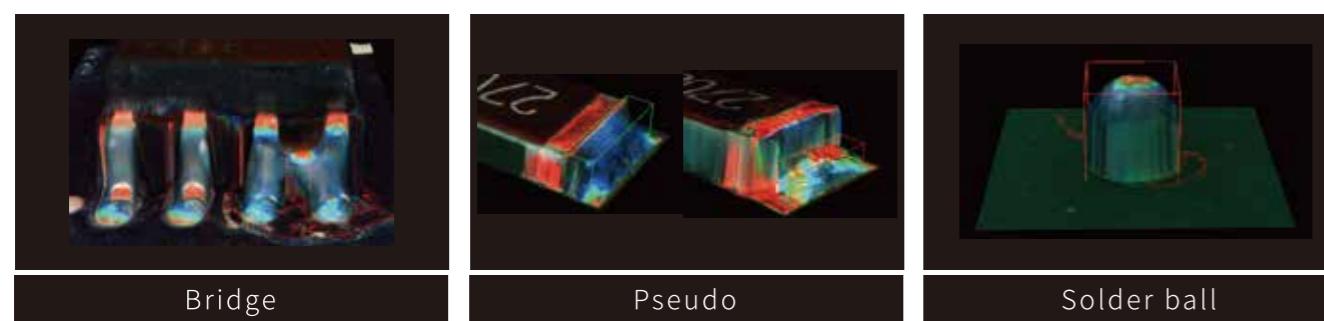
·**Specification**

Category	Item	AIS430	AIS431-D
PCBA specification	Size	50x50mm~510*460mm (Large board mode：Max770*460mm)	50x50mm~510*610mm (single rail operation) 50x50mm~510*330mm (Dual rail operation)
	Thickness	0.5mm-6mm	
	Height of elements	Top:25mm, Bottom: 50mm	Top:25mm, Bottom: 30mm
	Processing edge	3mm	
Optical specification	Camera	12MP, color	
	Optical source	RGB + W four color integral light source+ 4 optical source for projection	
	FOV	40*30mm	
	Resolution ratio	10um	
Inspection-related function	Components	Lifed, float,absent, reversed, offset, upside-down, tombstone, broken, extra,foreign matter, stained, etc.	
	Solder	Insufficient,excessive,missing, bridge,solder void,etc.	
	Other function	Bar code Recognition / QR code Recognition/ OCR	
	Mixing boards inspection	Yes,Support calling program automatically	
	Algorithm	CNN, color contrast, outline recognition, offset inspection, template matching, character comparison, OCR ,etc.	
	Speed	0.55sec/FOV	
Software system	Operating system	Ubuntu 18.04 LTS 64bit	
	Function	Remote control, remote assistance, CAD file import and user-defined model training	
	Communication method	Standard SMEMA interface	
	Data output	Autogenerated statistic analysis SPC	
	Special function	Automatic search of elements and quick programming	
Hardware specification	Industrial control host	CPU: intel i7 Display card: Gigabyte RTX2060 8G display Memory: 64G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	
	Display	23.8 inch FHD display	
	Motion mechanism	High precision lead screw + servo motor	
	Rail width control	Manual/auto	
Appearance/ electric	Dimention and weight	（L*H*W）1150*1630*1320，net weight:870Kg	（L*H*W）1150*1600*1615，net weight:1080Kg
	Power supply and power	AC 220V, rated power 570W	AC 220V, rated power 650W
	Air source	0.4-0.6Mpa	
	Work environment	Temperature：10~45℃, Humidity: 30~85%RH	

AIS63X Series-SPI

Inline Solder Print Inspection
To Inspect solder print defects such as insufficient solder, excess solder and thickness defect etc

Core Advantages
· 3-point verification
· Realize closed-loop function combining printing machine
· NG board flying identification function & chip mounter BadMark point sharing function
· Minimalist programming, easy operation, multi-machine interconnection can be realized
· Support whole board image storage
· Realize real-time SPC monitoring and analysis

· AIS630P

1114mm
1950mm
1600mm

1335mm
+20mm
900 -20mm
50-460mm 293mm

· AIS630P-D | Dual rail

1175mm
1110mm
1950mm
1600mm

1622mm
+20mm
900 -20mm
330mm 330mm
332mm
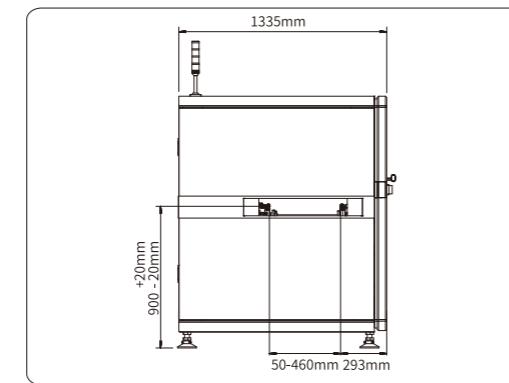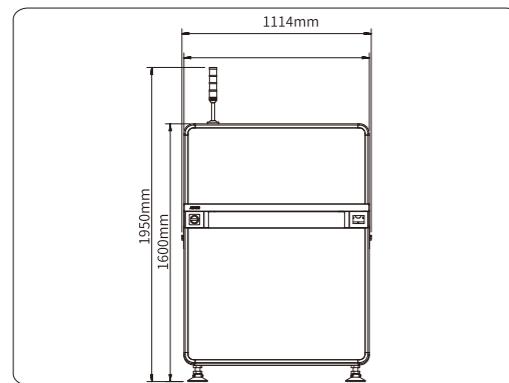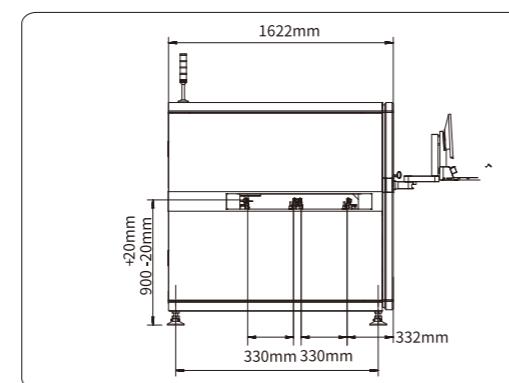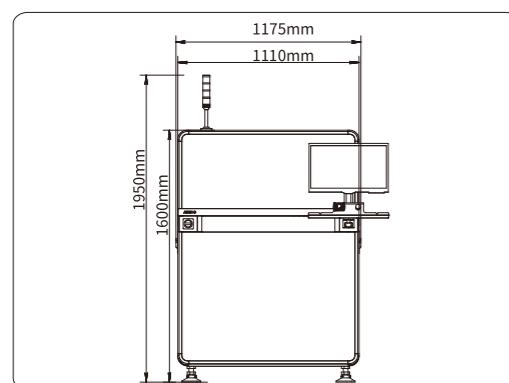
· Application | After reflowz

· Defect Type
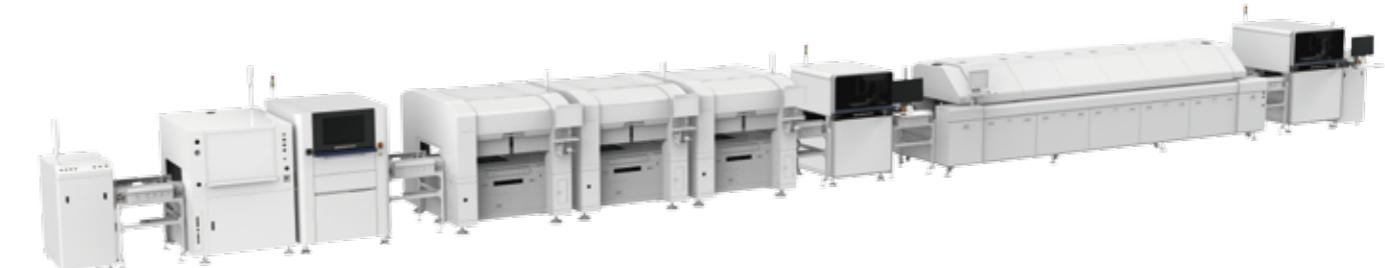
| Solder | Shape / Height | Insufficient / Excessive | Offset Bridge |
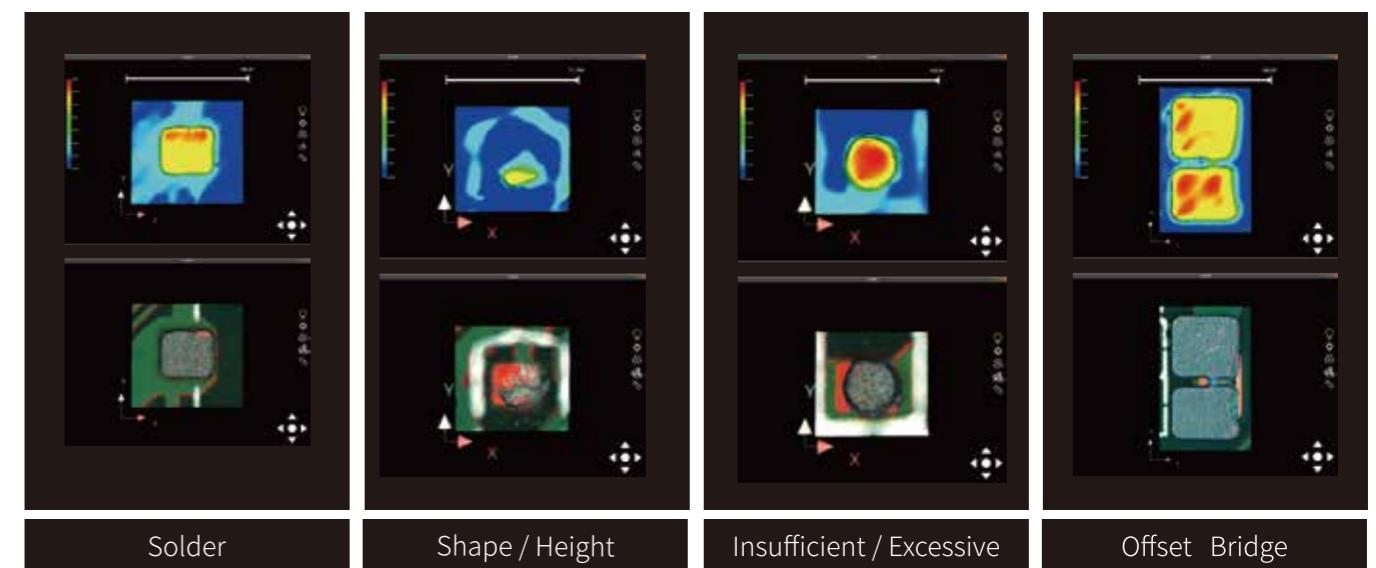
· Tracing system and 3-point verification function*

3-point verification function realized the unified monitoring of the whole production line, which is helpful for data tracing and improving production quality

Bar code tracing system

Sever

AOI after reflow

AOI before reflow

SPI
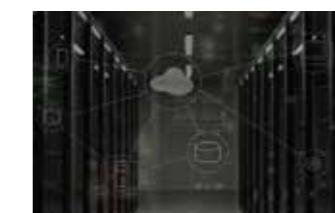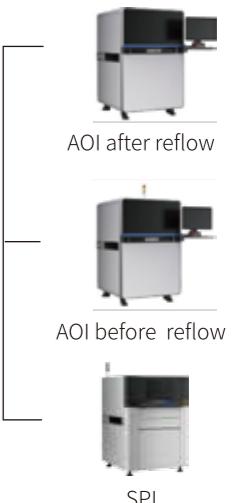
*SPI，AOI before and after reflow should be products of Maker-Ray

· Specification

Category	Item	AIS630	AIS630P-D
PCBA specification	Size	50*50mm~510*460mm	50x50mm~510*610mm (single rail operation) 50x50mm~510*330mm (Dual rail operation)
	Thickness	0.5mm-6mm	
	Height of elements	Top:25mm, Bottom: 50mm	Top:25mm, Bottom: 30mm
	Processing edge	3mm	
Optical specification	Camera	4MP，color	
	Optical source	RGB + W four color integral light source+ 2 optical source for projection	
	FOV	30*30mm	
	Resolution ratio	15um	
Inspection-related function	Solder	Insufficient,excessive,bridge, height, pull, shape,solder void,etc.	
	Other function	Bar code Recognition / QR code Recognition/ OCR	
	Mixing boards inspection	Yes,Support calling program automatically	
	Algorithm	CNN, color contrast, outline recognition, image contrast,etc.	
	Speed	0.33sec/FOV	
Software system	Operating system	Ubuntu 18.04 LTS 64bit	
	Function	Remote control, remote assistance,Gerbe file import and user-defined model training	
	Communication method	Standard SMEMA interface	
	Data output	Autogenerated statistic analysis SPC	
	Special function	Automatic search of pad and quick programming	
Hardware specification	Industrial control host	CPU: intel i7 Display card: Gigabyte RTX2060 8G display Memory: 64G DDR, 256G SSD+2T Mechanical Hard Disk Network: 1000M Wired Network Card	
	Display	23.8 inch FHD display	
	Motion mechanism	High precision lead screw + servo motor	
	Rail width control	Manual/auto	
Appearance/ electric	Dimention and weight	(L*H*W) 1110*1656*1605，net weight:870Kg	(L*H*W) 1110*1280*1605，net weight:1080Kg
	Power supply and power	AC 220V, rated power 570W	AC 220V, rated power 650W
	Air source	0.4-0.6Mpa	
	Work environment	Temperature：10~45°C, Humidity: 30~85%RH	

▬▬ MKR-AOI-RS100 | Workstation for Maintenance

· **Used with AIS30X, AIS40X, AIS50X and AIS63X to locate defects.**

▬▬ Advantages

QUALITY CONTROL

9001&14001 Quality System Certificate

RESEARCH TEAM

With over 70% of technical staffs for R & d

ADVANTAGE OF SCALE

Share the suppliers and manufacturing system from the purchasing platform valued RMB ten-billion.

TECHNOLOGY ACCUMULATION

With over 10 years of experience for industrial research and development and supply chain management .Deeply research in deep learning algorithm and its visual application

Join Hands and Work Towards Win-win