



SIGMA X



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SIGMAX

New Generation



World Class 3D Solder Paste Inspection

PARMI
Pattern Recognition &
Machine Intelligence

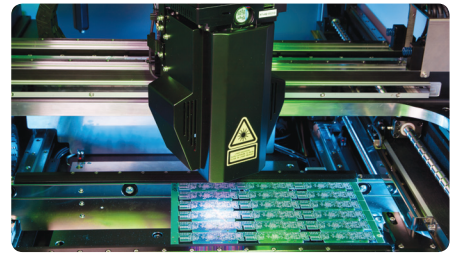
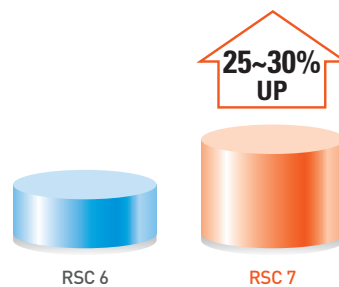
SIGMAX

New Generation

RSC 7 Sensor

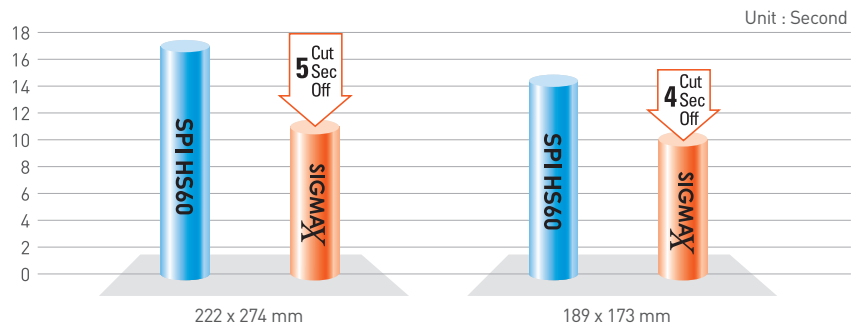
- Fastest Inspection speed and Highest Measurement reliability
- Inspection speed increased by 25 ~ 30% over RSC 6

* SIGMA X Orange : 100cm²/sec @ 10x10μm
* SIGMA X Blue : 60cm²/sec @ 10x10μm



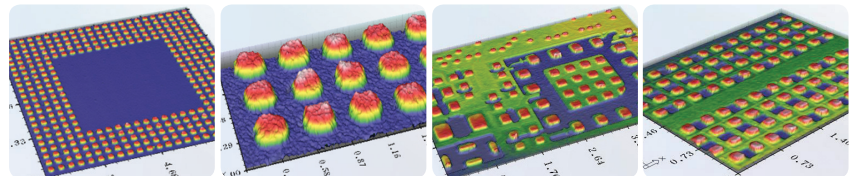
Improve Board Transfer Sequence

- Conveyor speeds up to 1000mm/sec
- Loading /Unloading time minimization
- 3 ~ 4 sec improvement compared with HS60 using the same board inspection



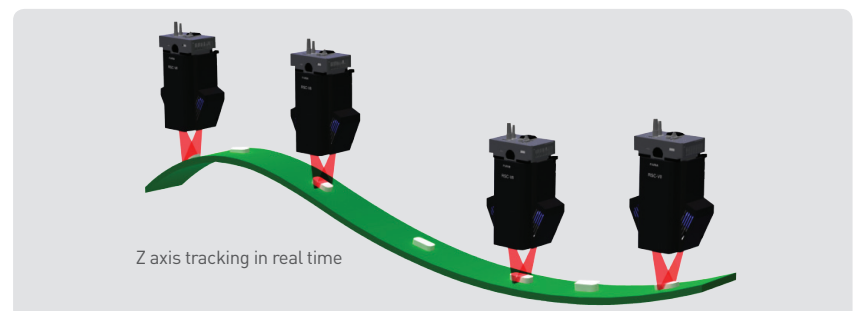
Real 3D Image

- PARMi's inspection technology is unaffected by varying materials, surface conditions or colors. The system profiles the board to generate accurate 3D shapes far superior to other brands and technologies.



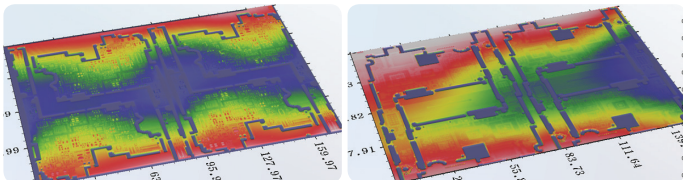
Warpage Tracking in Real Time

- The system identifies total board warpage up to 10mm(±5mm) and the exclusive Z Axis motion control system maintains optimal depth of focus while measuring Warpage.



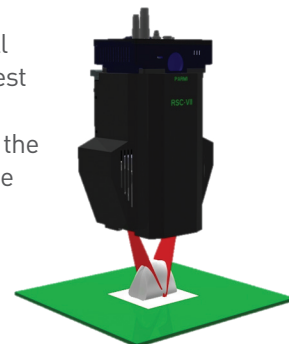
PCB Warpage Measurement

- Innovative whole board scanning uniquely delivers precise measurement of both the board surface and solder deposits.



Dual Laser Projection

- Dual laser projection eliminates all shadowing and produces the highest level of measurement accuracy. Using a high frame CMOS camera the system realizes the 3D shape of the entire board scanning area.



PCB Stretch and Shrink Management

- Managed by comparing the board image and Gerber Data, fiducial coordinates and printed material offsets are identified and communicated to upstream and downstream processes supporting closed loop control.

Highest Quality Parts

- Steel castings and linear glass encoders dampen vibration, address temperature fluctuation and provide high accuracy and repeatability.



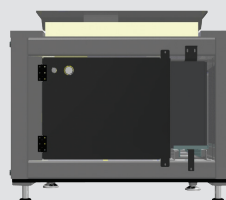
Ultra-SLIM Footprint

- Efficient use of the inside space of the machine.
- RSC 7 size reduced.
- Effectively increasing the inspection area and reducing the machine dimensions simultaneously.



The Most Stable Platform

- Strong X/Y Stage and base frame
- Lightweight moving parts
- Most stable and fastest, vibration free motion delivers high accuracy and repeatability.



Electronic Components Repositioned for Easier Access.

- Designed for front machine access providing quick and easy access to the operating system.
- Slide rail for PC makes you access to back-side of machine easily.

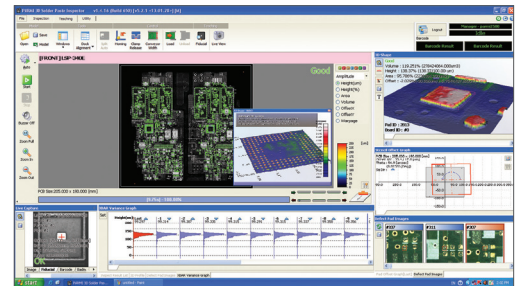


All New Cover Design

- Refined and luxurious exterior
- Simple monitor console.
- Most external switches are eliminated.

Main Inspection Program (SPIworksPro)

- PARMi's main operating screen assists in addressing and stabilizing the screen printer process by showing and analyzing the results by color, in real time.
- User Interface windows are easily arranged, sized and saved per user preference. Multi-level accessibility settings ensure program and process integrity.



Defect Analysis (DefectAnalyzerPro)

- Defect analysis by time period and product model
- Analysis of defects by Warpage, Defect type, User ID, Inspection time on a panel list basis.
- Shows 3D Images for Defective pads with adjustable viewing angles and color.

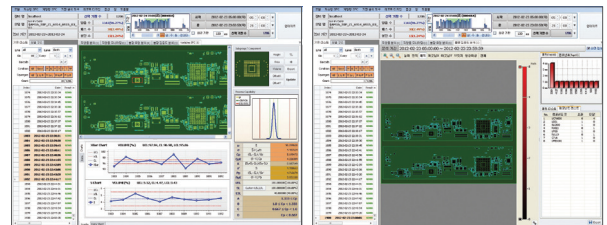


Statistical Process Control (SPCworksPro)

- PARMi's feature packed SPCworksPro software is practical and useful software for integrated process analysis. Both Statistical and Attribute SPC data are provided. Monitoring and control of your Parmi machines is easily accomplished both locally and remotely.

Variables SPC

- Average (Xbar) Control Chart
- Range Control Chart
- Standard Deviation Control Chart
- Moving range Control Chart
- Process Capability by Cp, Cpk.

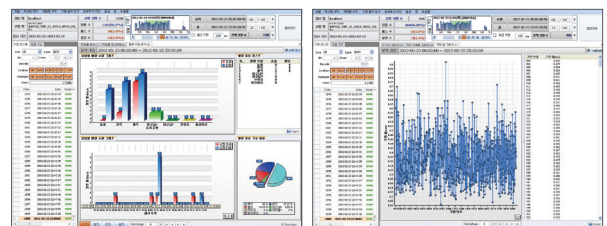


Attributes SPC

Defect concentration

Attributes SPC

- Non-adjusted Ratio Analysis, Yield rate monitoring
- Defect numbers, location, type, concentration analysis
- Height, Area, Volume Histograms
- Offset, Panel Shrink & Warp graphs
- Module & Model Yield statistical tools

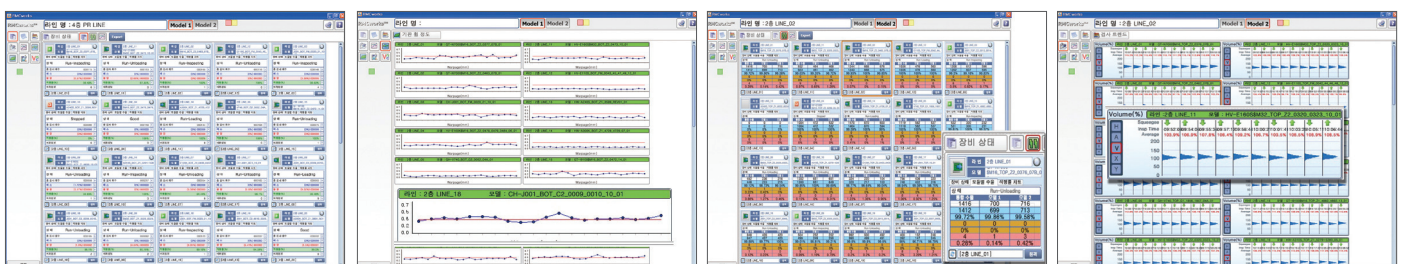


Variables SPC

Warpage graph

Remote Monitoring and Control (RMCworks)

- Enables control of single or multiple SPI systems at remote sites. Helps to reduce manpower and obtain consistent quality by managing all the equipment from a small number of managers.



Yield rate

Stretch and Shrink

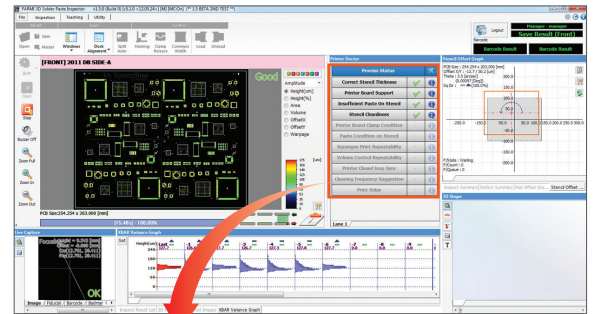
Production Yield

X-bar Variance

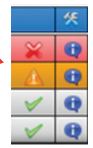
Printer Doctor

PARMI's Exclusive Printer Doctor takes prompt action to judge the most probable reason of defects by itemizing all of the potential defect elements in the printing process.

- Patent pending advanced technology
- Constantly analyzes solder paste deposit data in real time
- Identifies symptoms individually and by trend in real time to determine if the process is at fault
- Offers user defined corrective actions for operators
- Defect description instructs the operator what to look for and where the issue(s) are
- Intuitive user-friendly interface
- Manager editable descriptions allow for additional instructions for the operator.



Process Status		
Correct Stencil Thickness	-	i
Insufficient Paste On Stencil	-	i
Stencil Cleanliness	-	i
Printer Board Support	-	i
Printer Squeegee Condition	-	i
Printer Board Clamp Condition	-	i
Volume Control Repeatability	-	i
Printer Closed Loop Sync	-	i
Printer Closed Loop Error	-	i



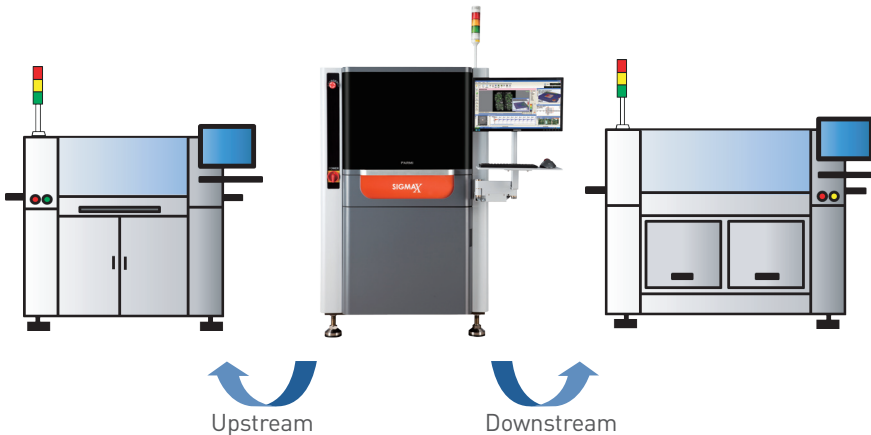
Simple check box shows status



Multiple process variables monitored

Single click access for information including results and operator actions

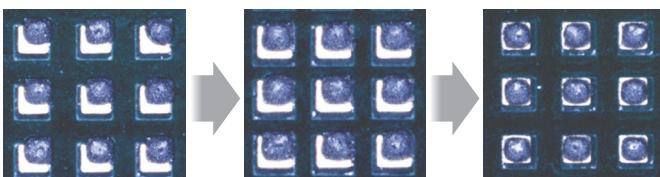
Real Time Closed Loop System



Process Control by Closed Loop

Closed Loop Feedback System

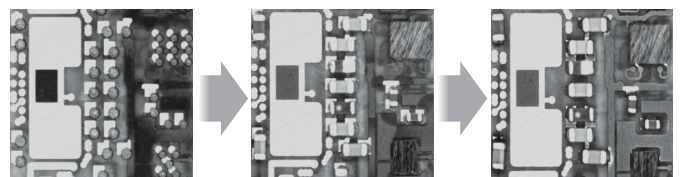
Automatic feedback of print offsets and print rotation as well as the initiation of under stencil wiping routines to continually improve print performance and reduce rework.



• Partners : MPM, DEK, EKRA, Samsung Techwin, PDT, ESE, SJ Inno Tech, HIT, and others

Closed Loop Feed forward System

PARMI SPI communicate to placement machines includes X, Y and rotational offsets, and bad mark data.



• Partners : Panasonic

Specifications

Model	SIGMA X Blue	SIGMA X Orange
RSC VII 3D Sensor Camera		
Measuring Principle	Shadow free Dual Laser Optical Triangulation	Shadow free Dual Laser Optical Triangulation
Camera System	High Frame Rate C-MOS Sensor (4 Mega Pixels)	High Frame Rate C-MOS Sensor (4 Mega Pixels)
Scan Speed (sq.cm/sec)	60	100
* X-Y Resolution (μm)	10 x 10	10 x 10
Lateral Length (mm)	32	32
Height Resolution (μm)	0.1	0.1
Paste Type Supported	All (Pb or Pb Free)	All (Pb or Pb Free)
Board Type Supported	All Colors and All Pads	All Colors and All Pads
X-Y-Z robot	Sensor Head Move in X-Y-Z Axis	Sensor Head Move in X-Y-Z Axis
Performance		
Height Repeatability	3 Sigma < 1 μm, on a certification target	3 Sigma < 1 μm, on a certification target
Area Repeatability	3 Sigma < 1%, on a certification target	3 Sigma < 1%, on a certification target
Volume Repeatability	3 Sigma < 1%, on a certification target	3 Sigma < 1%, on a certification target
Height Accuracy	2 μm, on a certification target	2 μm, on a certification target
Gage R&R	<< 10 %	<< 10 %
Measurement		
* Inspection Type	Height, Area, Volume, Offset, Bridge, Shape, Warpage, PCB shrink	Height, Area, Volume, Offset, Bridge, Shape, Warpage, PCB shrink
PCB Warpage	±5 mm (2%)	±5 mm (2%)
Min. Paste Size (μm)	100 x 100	100 x 100
Max. Paste Size (mm)	20 x 20	20 x 20
Min. Paste Pitch (μm)	80	80
Max. Paste Height (μm)	1000	1000
Board Dimension		
Minimum Size (mm)	50 x 50	50 x 50
* Maximum Size (mm)	480 x 350	Standard : 480x350 (3 Stage Conveyor Option : 350 x 350) Large : 580 x 510
Board Thickness	0.4 to 5 mm	0.4 to 5 mm
Maximum Board Weight (kg)	2	Standard : 2, Large : 5
TOP/Bottom Edge Clearance (mm/mm)	2.5/3.0	2.5/3.0
Underside Clearance	30	30
System Dimension		
* Dimensions (W x D x H)	850 x 1205 x 1510	Standard : 850 x 1205 x 1510 (3 Stage Conveyor Option : 1210 x 1205 x 1510) Large : 950 x 1365 x 1510
Weight (kg)	800	Standard : 800, Large : 900
Conveyor Height (mm)	860 - 980	860 - 980
Conveyor Speed Range	300 mm/sec ~ 1000 mm/sec	300 mm/sec ~ 1000 mm/sec
Flow Direction	Left → Right or Right → Left (Factory Setting)	Left → Right or Right → Left (Factory Setting)
Conveyor Width Adjusting	Auto Adjustable	Auto Adjustable
Computer & Console		
CPU	I5 2500, RAM 16GB	I5 2500, RAM 16GB (Large : RAM 32 GB)
Operating System	MS-Window 7 64bit	MS-Window 7 64bit
Display	20" LCD	20" LCD
Enclosure	Conforms to CE Regulations	Conforms to CE Regulations
Supplies	AC 220V, 5 Kgf/sq.cm	AC 220V, 5 Kgf/sq.cm
Software System		
Inspection Program	SPIworksPro	SPIworksPro
Offline Teaching	EPM-SPI	EPM-SPI
SPC & Process Monitoring	SPCworksPro	SPCworksPro
Remote Machine Control	RMCworks	RMCworks
Defect Analyzer	AnalyzerPro	AnalyzerPro
System Diagnosis	SPImanager	SPImanager
Options		
Ultra Sonic Sensor	PCB Detect by Ultrasonic Sensor	PCB Detect by Ultrasonic Sensor
Fixed Barcode System	Top/Bottom Side Recognition (Input Conveyor 150mm Extension) / 1D or D+2D	Top/Bottom Side Recognition (Input Conveyor 150mm Extension) / 1D or D+2D
Sensor Embeded Barcode System	Topside Recognition (1D+2D)	Topside Recognition (1D+2D)
Back Up Plate	Back Up Plate / Back Up Pin (Bottom Clearance 25 mm)	Back Up Plate / Back Up Pin (Bottom Clearance 25 mm)
UPS	PC Power Save (7~8 min)	PC Power Save (7~8 min)
HDD RAID System	HDD Mirroring System	HDD Mirroring System



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• Please note that specifications and product information in this catalog are subject to change without notice.