PARMI

PATTERN RECOGNITION and MACHINE INTELLIGENCE

SIGMAX

WORLD CLASS 3D SOLDER PASTE INSPECTION

PARTNERING WITH **PARMI**

Leading edge, innovative technology leveraged to add value to your business

Thank you for your interest in PARMI and our solder paste inspection products. We appreciate the opportunity to address your needs and to present our products, services and solutions.

Our focus is on adding value to your business. Whether we're helping to ensure a dependable revenue stream, increasing your efficiency and profitability, sharing knowledge to solve a problem or helping to increase your competitiveness, it's really about you and how our product helps yours.

Founded in 1998, PARMI delivered its first in-line system in 2005. Since then PARMI has delivered thousands of systems.

Synonymous with innovation, PARMI systems are known for new technology and the highest industry performance. At PARMI we don't just *think* out of the box, we *act* out of the box.

From bench top, single and triple track, and dual lane models our machines perform in any application. Our innovative technology, industry leading cycle times and global support set us apart as a world leader.

Thank you for your interest. Please know PARMI is committed to delivering all promised value in our products and services. We look forward to learning more about your needs and working with your team.

TEAM PARMI

TOTAL PERFORMANCE

Straight open talk about how our product impacts yours.
No hype. No specsmanship. No guessing. Real numbers.

HIGH REPEATABILITY, HIGH ACCURACY and HIGH SPEED

- Height accuracy: 2 µm
- Height repeatability: 3 Sigma <1 µm
- Volume repeatability: 3 Sigma <1%
- Area repeatability 3 Sigma <1%
- Gage RR is << 10% / 0402~1608 inch chip
- 100 cm ^{2} per second @ 10 x 10 µm resolution

INDUSTRY LEADING CYCLE TIMES

SIGMA X's combination of speed, resolution, repeatability, precision construction and broadest feature bandwidth produces industry leading cycle times.

THE MOST STABLE and VIBRATION FREE PLATFORM

Unlike competing systems using gray scale imaging and stop and go motion control, Parmi's exclusive shadow-less Dual Laser system offers smooth and continuous scanning motion delivering the industry's most stable and vibration free platform.

PARMI products are built with the highest quality materials—no compromises. Steel castings and linear glass encoders dampen vibration, address temperature fluctuation and provide high accuracy and repeatability. All systems are CE certified.

SEEING IS BELIEVING

Simply visit our facility for a hands on introduction or send us your boards, stencil and Gerber / CAD data. We'll complete a Design of Experiments (DOE) which includes all elements of the process confirming PARMI performance eliminating guesswork, surprises and specsmanship.

The total cycle time study starts with wet printing your board and includes all inspection steps including PCB transport in, fiducial processing, paste inspection, data analysis, pass/fail determination and PCB transport out. We'll provide a report confirming the data along with a video and 3D images.

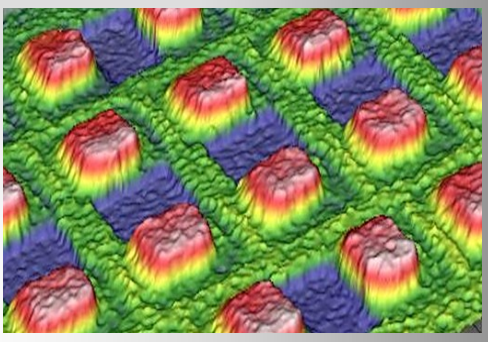
ACHIEVING TECHNICAL **EXCELLENCE**

Creating innovative technology and solutions to solve your problems is at the heart of what we do

EXCLUSIVE DUAL LASER TECHNOLOGY

PARMI's exclusive Dual Laser Technology and high speed color CMOS camera captures projected laser light beams eliminating shadowing. The laser based scanning system has no internal moving parts offering superior reliability. The system constructs a height map profile for each pixel and a true 3D shape for the entire scanned area.

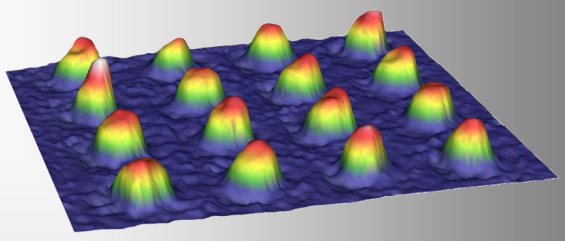
Real time data acquisition and analysis provides immediate access to results, delivering the industries shortest cycle times.



REAL 3D IMAGE UNAFFECTED BY MATERIAL COLORS, FINISHES AND WITHOUT NOISE

BROADEST BANDWIDTH

Bandwidth capability is a critical factor when selecting an SPI system. PARMI's system offers fine scale measurement and the widest target bandwidth. Compatible with all PCB colors and finishes, the system identifies all features including via holes, and edge of board and routing, and is compatible with HASL pad finish. The vertical inspection range is +/- 1 mm. This delivers virtually zero false calls and zero false escape rates maximizing throughput and yield, and reduces operator intervention.



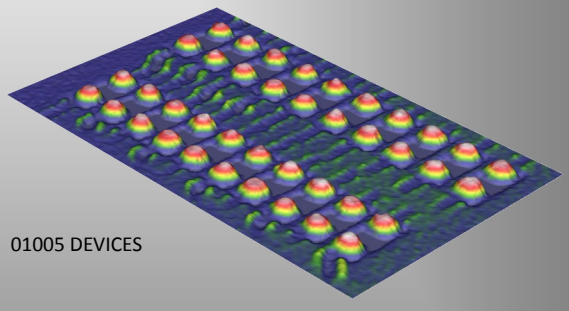
VARYING DEPOSIT HEIGHTS

INDUSTRY'S BEST PCB WARP CONTROL

Innovative Real Time Z Axis tracks with your PCB surface. Measuring in both X and Y the system covers +/- 5mm of panel warp. It provides optimal camera and laser focal distance ensuring accurate measurement across the whole panel. The system easily measures and adjusts for warp. Operators are prompted to remove out of spec PCBs. The system measures and displays warp across the entire PCB.

CLEAREST and MOST REALISTIC IMAGES

Vivid 3D images are colored according to measured height, volume, offset, sigma and defect frequency. The system simultaneously shows both defective pads and surrounding pads. Images are easily rotated, enlarged and exported. All image processing is completed within the inspection head and not in the machine computer. Inspection results are viewed instantly, in real time.



01005 DEVICES

CONTINUOUS PROCESS IMPROVEMENT

PARMI's exclusive automatic data analysis, messaging and process control tools ensure your performance is always improving

OUR VISION

PARMI's name means Pattern Recognition and Machine Intelligence. The vision of using SPI for more than just a good board/bad board finder is deeply rooted in PARMI. PARMI systems offer features that do the work for you. With PARMI'S machine intelligence features on-board it's like getting a process engineer shipped in the box. You'll have the peace of mind knowing your process is always being monitored, in control and continually improving.

EXCLUSIVE "PRINTER DOCTOR"

The revolutionary patent pending system automatically correlates inspection results to screen printing variables in real time. The system identifies issues and provides operators with corrective actions you define.

The system monitors digital variables and trend change—alerting operators to issues before failure threshold settings are reached, detecting and preventing defects.

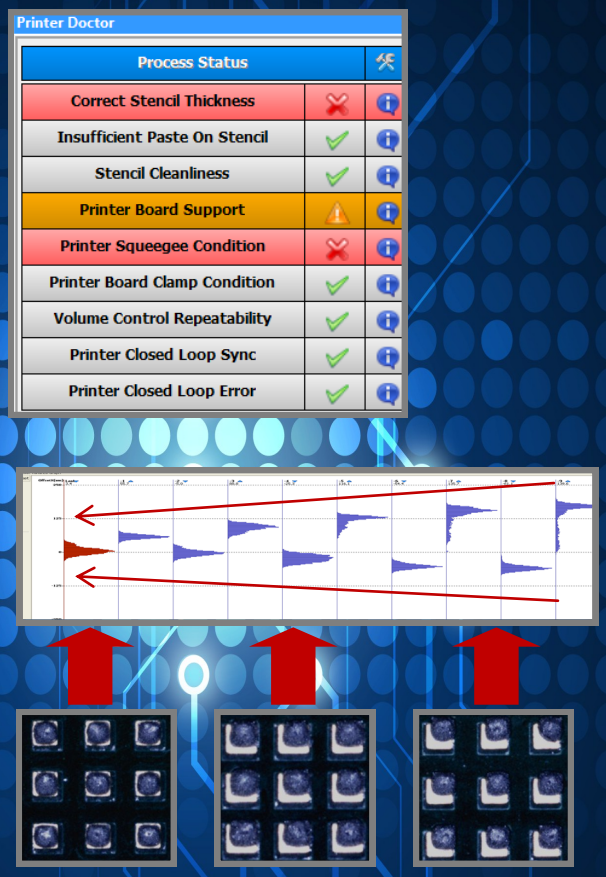
Several variables are monitored including PCB support tooling, stencil thickness, solder paste condition, squeegee blade condition, print variation and trending. Printer Doctor is your prescription for success.

CLOSED LOOP

In addition to its exclusive Printer Doctor technology, PARMI works with many industry suppliers to Close The Loop — communicating to upstream and downstream processes.

Upstream communication to the screen printer includes solder paste deposit X, Y and rotational offsets, and triggering of stencil cleaning routines. A standard closed loop feature is squeegee direction detection eliminating the need to purchase barcode readers reducing closed loop implementation costs.

Downstream communication to placement machines includes X, Y and rotational offsets, and bad mark data.



Images above shows how Closed Loop processing with a screen printer offsets the solder paste deposits onto pads

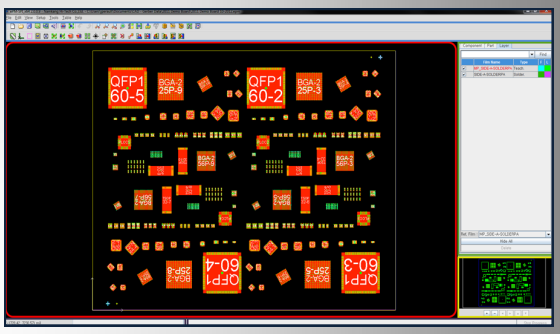
Images above show Closed Loop processing with a placement machine to position a component onto the solder paste

YOUR LIFE
SIMPLIFIED

Easy to use and easily integrated into your assembly process.
Your return on investment starts on day one

EASY OFF-LINE PROGRAMMING

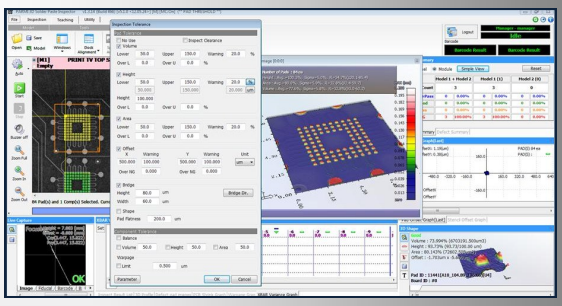
Programs are easily and quickly generated off-line using industry standard ePM software with Gerber RS-274X and complete CAD support. Fiducials are taught in the program and offers advanced ARRAY programming. The system can even import programs previously generated from other brands of SPI using ePM, reducing switching costs.



USER DEFINABLE INTERFACE

PARMI's User Interface is completely customizable by you. Every member of your team can save their preferred "look and feel" for recall and use. Users may create simple screens for operators and detailed views for engineers.

Security settings limit access to ensure process integrity.

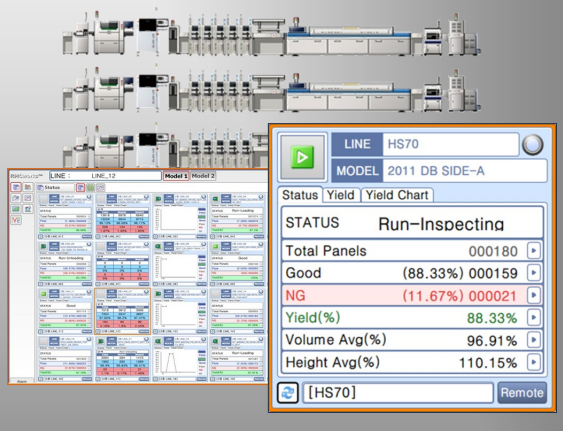


SIMPLE OPERATION

Control and specification limits are easily set. Programmed tolerances and settings may be viewed and changed "on the fly" during production without exiting the main operating screen. Settings include component balance, volume, height, area, offset, bridging, shape, and warp. The system provides easy indication of Pass/Fail status and simple "zoom in" viewing of defects. Optional downstream defect review station and PCB buffer conveyors are easily integrated.

REMOTE MONITORING and CONTROL

The standard feature permits viewing of operational performance and system control from your desktop. Whether you use one or multiple systems, you have visibility to all your machines' status and performance. Multiple data points include quantity of good and bad PCB's, yield, trend, panel shrink, warp, and others. You may also set alarms and messaging, and take control of the machine remotely.



AUTOMATIC CALIBRATION ROUTINES

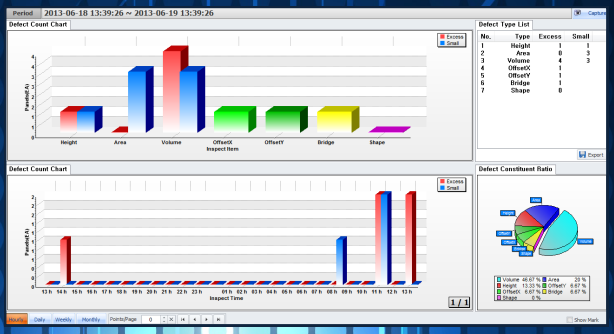
Custom calibration boards and built in software calibrate the system in fifteen minutes. The routine ensures your system is running optimally, is easy for your personnel to use and addresses your customers questions about your calibration process and practices.

SOFTWARE TOOLS
ELIMINATE DEFECTS

PARMI's software is feature packed to help solve root-cause problems

FLEXIBLE, POWERFUL AND EASY TO USE

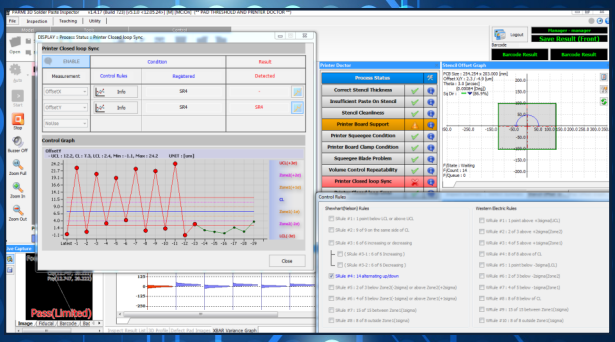
PARMI's software offers many useful tools for fast analysis of the printing process. Both Variable and Attribute SPC are provided, and monitoring and control of your PARMI machines is easily accomplished locally or remotely.



SPIworksPRO MAIN OPERATING SOFTWARE

SPIworksPro's main operating screen is easy to navigate and user-definable. It provides 3D measuring, defect review, data and model management, process monitoring and control.

It also provides easy viewing of Parmi's exclusive Printer Doctor software. Printing performance is presented by value, sigma, fault frequency, X bar and variance charts.
Its interface includes a defect viewer for current PCB and past PCB's.



SPCworksPRO STATISTICAL SOFTWARE

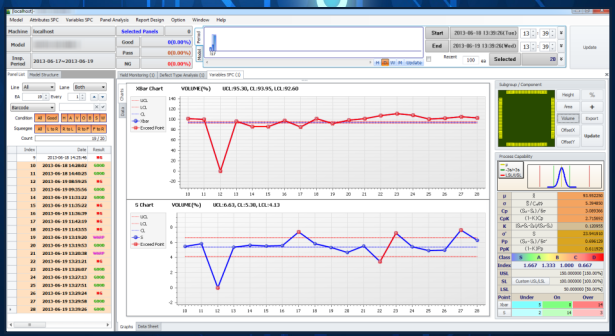
Software tools like SPCworksPro are focused on root-cause analysis and finding the origin of defects.

Qualitative analysis is provided by Control Chart, Cp, Cpk and others.

Quantitative analysis is provided by Yield trending, DPMO, defect type, defect frequency, R and X bar, Sigma, CP and CPK formats and others.

The data can be viewed on and off the machine and the SPC software can be installed on as many desktop computers as you like.

Data reports are easily generated and exported.



GLOBAL SOLUTIONS

PARMI systems are configurable to meet a variety of applications and supported worldwide

FLEXIBLE AND CUSTOMIZABLE

PARMI's Sigma X can be customized for your needs.

Standard options include triple track conveyors, top and bottom barcode integration, barcode driven changeover, off-line programming, under board support, UPS back-up, Closed Loop communication, downstream defect review station, RAID data back-up, custom MES integration and others.

PARMI takes pride in customizing software and hardware to meet special customer needs. Its unique technology is also compatible with non-standard applications.

Please consult with your local sales agent to address your specific needs and special requests.

PARMI PARTNERS

PARMI teams with leading suppliers to develop complete solutions.

Reciprocal equipment agreements with leading suppliers permits us to develop solutions together, to validate designs and to test functionality before it reaches your facility.

Please consult with your local sales agent for an up to date list of our partners.

BENCHTOP SYSTEMS

PARMI offers two high performance bench top systems suitable for multiple lines, batch analysis, low volume, R & D and lab applications.

GLOBAL SUPPORT

PARMI systems are supported globally through a network of servicing agents and direct PARMI facilities.

Expert level support is available for wet printing and inspection, design of experiments, stencil design, on-site and off-site training, spare parts and local service.

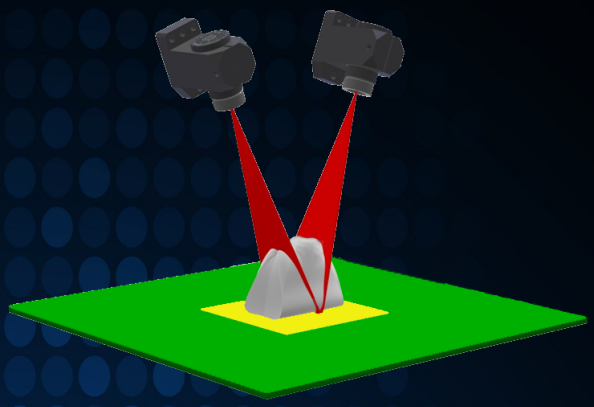
Team Viewer provides remote access and diagnostics of your system from your facility to ours.

PARMI SIGMA X

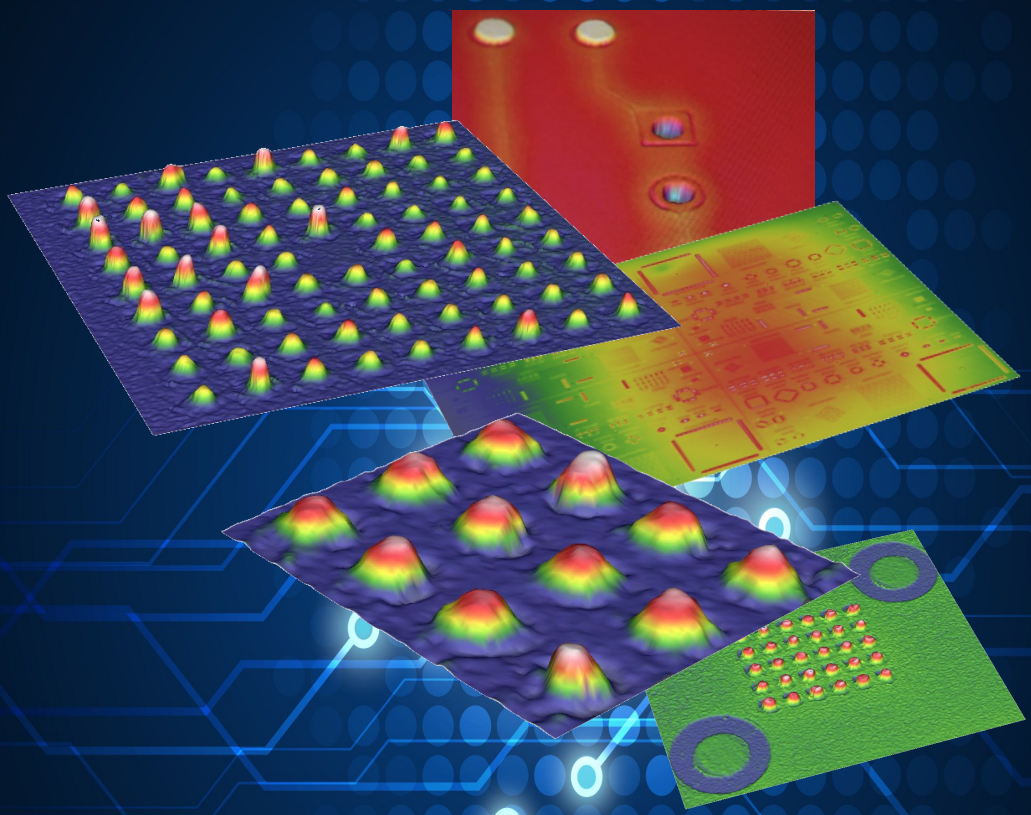
SIGMA X INSPECTION TECHNOLOGY	August 12 2013
Laser	Dual Diode Laser Sheet beam, Optical Triangulation , Shadow free , No moving parts
Camera	High frame rate C-MOS sensor
Motion control	High resolution linear motors, Glass scale linear encoders, Continuous scanning motion (no start and stop)
Motion axis Z	10 mm [0.4"] +/- 5 mm [0.2"], tracks with pcb warp
Attributes inspected	Component Balance, Height, Area, Volume, Offset, Bridge, Shape, Warp, Stretch / Shrink
Speed	100 cm^2 per second
X-Y Inspection Resolution	10 x 10 µm [0.0004" x 0.0004"]
Gage R&R	<< 10 %
Measuring bandwidth	+ / - 1 mm [0.040"]
Height Resolution	0.1 µm [0.000004"]
Height Repeatability	3 Sigma < 1 µm [0.00004"] with laboratory certified target
Area Repeatability	3 Sigma < 1% with laboratory certified target
Volume Repeatability	3 Sigma < 1% with laboratory certified target
Height Accuracy	2 µm [0.00008"] with laboratory certified target
PASTE MEASUREMENT	
Paste Maximum Height	1000 µm [0.039"]
Paste Maximum Size	20 x 20 mm [0.787" x 0.787"]
Paste Minimum Size	100 x 100 µm [0.004" x 0.004"]
Paste Minimum Pitch	80 µm [0.003"]
PCB COMPATIBILITY	
PCB Type Supported	All colors, all pad finishes inc HASL, all features inc Via holes, edge of board and routing, maps/displays warp of whole pcb
PCB Maximum size	Standard model 480mm x 350mm [19" x 14"] Large model 580mm x 510mm [23" x 20"] 3 Stage 350mm x 350mm [14" x 14"]
PCB Minimum size	50 x 50 mm [2" x 2"]
PCB Maximum weight	2.0 kg [4.4 lb] Large Model 5.0 kg [11 lb] Option 10 kg [22 lb]
PCB Maximum warp	±5 mm [0.196"]
PCB Thickness	0.4 mm to 5 mm [0.016" to 0.197"]
PCB Edge Clearance (Top)	2.5 mm [0.098"]
PCB Edge Clearance (Bottom)	3.0 mm [0.118"]
PCB Underside Clearance	30 mm [1.18"]
PCB HANDLING	
Conveyor Height	SMEMA 860 mm - 980 mm [33.6" - 38.6"] Option 830 mm - 930 mm [32.7" x 36.6"]
Conveyor Flow Direction	Left to right, Right to left, changeable
Conveyor Width Adjust	Auto Adjustable by program
Conveyor 3 stage	Option, Max PCB Size 350 mm x 350 mm [14" x 14"]
PCB detect	Optical sensor and Hard stop (optional Ultrasonic sensor)
Up / downstream Interface	SMEMA II, SV70
Repair station Interface	RS232 + LAN
Barcode system: External	Option, Top/ Bottomside recognition (Requires Input Conveyor 150 mm [5.9"] Extension) , auto download of new pcb program
Barcode: Internal	Option, 1D and 2D capable
Board support	Option, Support Plate / Pin, Bottom Clearance 25 mm [1"]
SOFTWARE SPECIFIC	
Inspection Interface	*SPIworksPro* User defined window layout, multi level security settings, 3D defect viewer, Paste deposit / component / board level X bar, R charts , Defect status by multiple attributes
Program tolerance changes	Made "On the fly" during production, no need to exit program
Offline Programming	Option, EPM-SPI, Gerber RS-274X, CAD, Fiducials, advanced array, imports other SPI brand EPM generated programs
SPC & Process Monitoring	*SPCworksPro* , yield trending, defect type and frequency, R and X bar, Sigma, CP, CPK, desktop compatible
Remote Access Functionality	*RMCworks* ; LAN, multiple machines, remote monitoring, remote control, alarms
Defect Analyzer	*AnalyzerPro*
Defect viewing	Defect pad and surrounding pads, 3D, color by value, sigma, frequency
Defect viewer	Current board, Past defect boards
Review station downstream	Option, Software and monitor for defect viewing
System Diagnosis	*SPImanager* , Remote diagnostics
ADVANCED PROCESS TOOLS	
Closed Loop processes	Option, Screenprinters, Component placement , AOI, (consult Parmi for updated supplier list)
Closed Loop data type	Printer: Barcode and Squeegee direction detection, X, Y, and rotation offsets, wiper triggering Placement: Component level X, Y, and rotation offsets, bad mark
Real time Printer data analysis	Printer Doctor software, automatic, monitors multiple variables, includes alarms, user defined corrective action messaging
SYSTEM	
Compliance	CE approved
Frame	Welded steel
Dimensions (W x D x H) mm	Standard 850 x 1205 x 1510 mm [Large Model 950 mm x 1365 mm x 1510 mm] [Standard (3 stage conveyor) 1210 x 1205 x 1510 mm]
Dimensions (W x D x H) inch	Standard 33.5" x 47.5" x 59.5" [Large Model 37.4" x 53.75" x 59.5"] [Triple stage conveyor 47.6" x 47.5" x 59.5"]
Machine weight	800 kg [1,764 lb] Large Model 900 kg [1,984 lb]
Electric	VAC: 220V +/- 10 %, single phase, 50 / 60 Hz, Rating 0.9kW(kVA), Peak 1.35(kVA)
Compressed Air	Clean, dry, 5 Kg / cm^2, 0.5 MPa [72 PSI], < 10 CFM
Computer	Intel I5 2500, RAM 16 GB or better [Large Model I5 2500, RAM 32 GB or better]
Operating System	Window 7 64 bit
Uninteruptable power supply	Option, UPS Computer Power Save
HDD RAID system	Option, HDD Mirroring hard drive back-up system
Human Interface	Trackball, Keyboard, 20" LCD Monitor
Custom paint	Option, provide RAL number

PARMI

SIGMAX



- Exclusive Dual Laser Technology
- No Shadow Effect
- Inspection Speed 100 cm ^{2} second @ 10 x 10 um
- Most Stable and Vibration Free Platform
- Ultra High Accuracy and Repeatability
- Active Z Axis for Real Time Warp Management
- Zero False Call and Zero Escape Rate
- Highest Quality Design and Construction

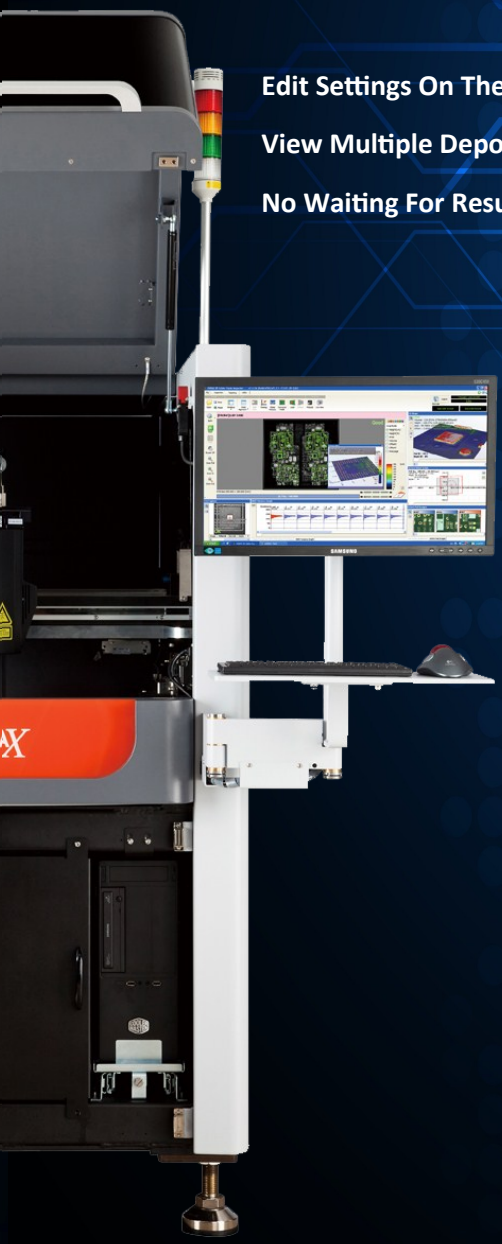


- Exceptional Imaging
- Broadest Feature Bandwidth
- Unaffected by Color, Board or Pad Finish Including HASL
- Clearest, most Realistic Images
- See's all Features including Via Holes, Board Edge and Routing

Edit Settings On The Fly

View Multiple Deposit Images

No Waiting For Results



Printer Doctor

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

Flexible and Powerful

Easy to Integrate and Use

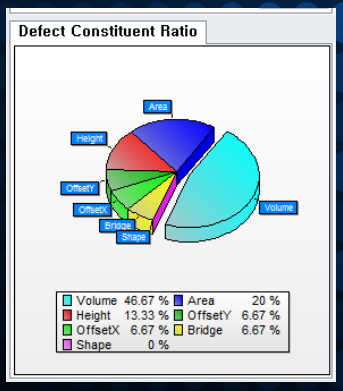
Automatic Process Monitoring

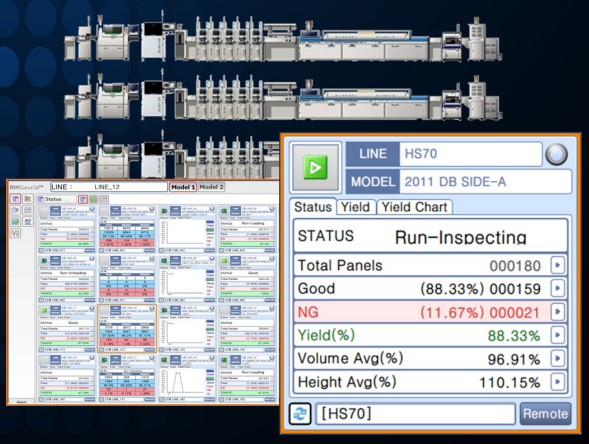
Complete Off-line Programming

User Definable Interface

Remote Monitoring and Control

Automated Calibration Routines





Industry's Most Intelligent Machine

Monitors Screen Printer Variables and Communicates to Operators

"Closed Loop" Communication to Neighboring Processes

Complete Reporting and SPC Package Focused on Root Cause and Defect Reduction

PARMI
GLOBAL PRESENCE

We're everywhere you are

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August 21, 2013