

Specifications

Functionality	Measuring Principle	Laser Optical Triangulation	
	Paste Type Supported	All (Pb or Pb Free)	
	Board Type Supported	All cobrs and All pad finishes	
	Offline Teaching	Gerberworks	
	SFC & Process Monitoring	SFCworks	
Measurement	System Diagnosis	SFImanager	
	Camera System	High frame rate C-MOS sensor, 18x18 μ m pixel resolution	
	Scan Resolution	20 μ m	
	Lateral Resolution	18 μ m	
	Height Resolution	0.2 μ m	
	Max. Paste Height	1000 μ m	
	Max. Paste Size	20x20 mm	
	Min. Paste Size	200x200 μ m	
	Min. Paste Pitch	150 μ m	
	Inspection Performance	Inspection Type	Height, Area, Volume, Offset, Bridge
Inspection Speed		30 sq.cm/sec	
Height Repeatability		3 Sigma < 1.5 μ m, on a certification target	
Area Repeatability		3 Sigma < 3%, on a certification target	
Volume Repeatability		3 Sigma < 3%, on a certification target	
Height Accuracy		3 μ m, on a certification target	
Gage R&R		Less than 10 %	
Board Specification		Maximum Board Size	370x250 mm
	Minimum Board Size	50x50 mm	
	Maximum Board Weight	0.7 kg	
	Maximum Board Warp	3 mm	
	Board Thickness	0.4 to 4 mm	
	Board Edge Clearance (Front/Rear)	4 / 4 mm	
	Underside Clearance	20 mm	
	Topside Clearance	16 mm	
	Hardware System	Dimensions (WxDxH)	760x927x578 mm
		Inspection Area	350x250 mm
Weight		110 kg	
X-Y robot		Sensor head move in X-Axis PCB Guide Unit move in Y-Axis	
Computer		Pentium IV 3.0GHz, 2GB Memory	
Operating System		MS-Windows XP Professional	
Display		17" LCD	
Input		Mouse, Keyboard	
Supplies		AC 220V	
Interface		Data Input Type	Gerber (RS-274X)
		Barcode (option)	1D, 2D

SPI 50T™

The optimal system for the solder paste printing process control



PARMI

PARMI CO., LTD.

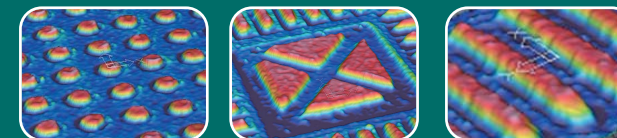
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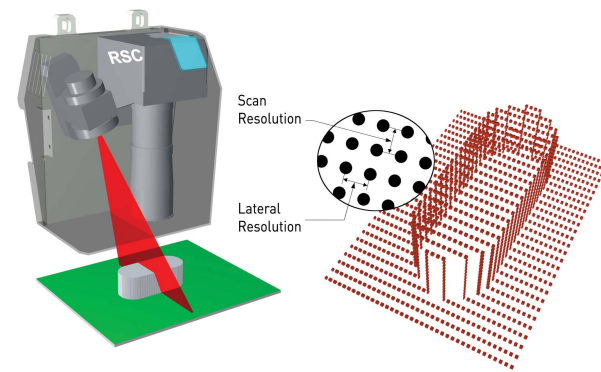
It is well known that defects of assembled PCBs are mainly related to the solder paste printing process. The trend toward applying very small device such as 0201 chip and CSP spread widely beyond the SMT assembly industry, and the lead free soldering exposures much more possibility of SMTA failures.

The SPI 50T is the most optimal off-line system for solder paste printing process monitoring and analysis. Its high inspection speed makes SPI 50T accommodate a few SMT lines simultaneously.

The most reliable 3D data and 100 % inspection

Our innovative 3D laser triangulation sensor, the RSC™ profiles real shape of features and also provides highly robust 3D data against considerable variations of PCB color and finishing condition, solder material, paste shape, and warpage. This highest quality of 3D data backs up top level performance of SPI 50T system concerning about the reliability and accuracy.

By virtue of the affordable profiling speed of the 3D sensor, the SPI 50T system provides 100% whole pads inspection in even fast assembly lines. The lateral resolution is set at 18μm along the Y axis direction and the scan resolution along the X axis is set at 20μm. This provides the system enables to inspect an area of 30cm² per second. This utmost inspection speed with best quality 3D data differentiates the SPI 50T system from other systems and leads the SPI 50T system to the top level.

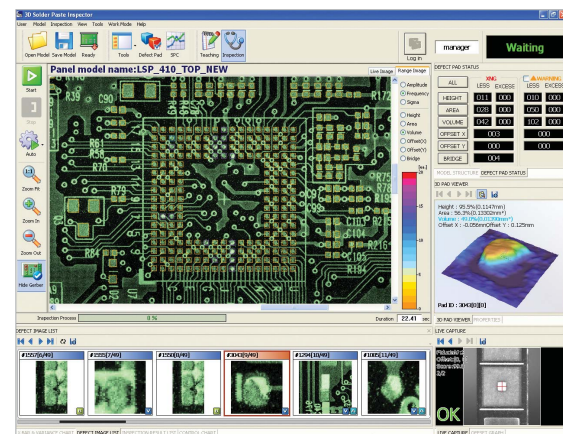


Authentic inspection and measurement

Our intelligent vision algorithm applied to the high quality 3D data detects every kind of solder paste defects. The measurable items are height, area, volume, and positional offset. And also the algorithm detects bridged pads in a very reliable manner. The remarkable design concept such as rotating the laser sheet beam against the scan direction and maintaining the small angle between laser sheet beam and camera optical axis for negligible shadow effect secure much better performance for repeatability and accuracy. Even for small CSPs and fine pitch QFPs, the Gage R&R is much less than 10% for both height and volume data.

Fast teaching and easy operation

The inspection job change consists of two stages. Teaching process using Gerberworks™ takes normally less than a half hour even in the case of complex PCBs. The Gerberworks inputs the industry standard RS-274X format file to prepare a hierarchy of information on a pad, component, and array board level that information is used during a PCB inspection. For the component level measurement and analysis, some CAD and BOM files can be imported. Teaching process using Gerberworks is done off line. And machine setting such as tolerance setting, that is second stage, only requires 10 minutes. This extremely short job change time save customer's valuable time.

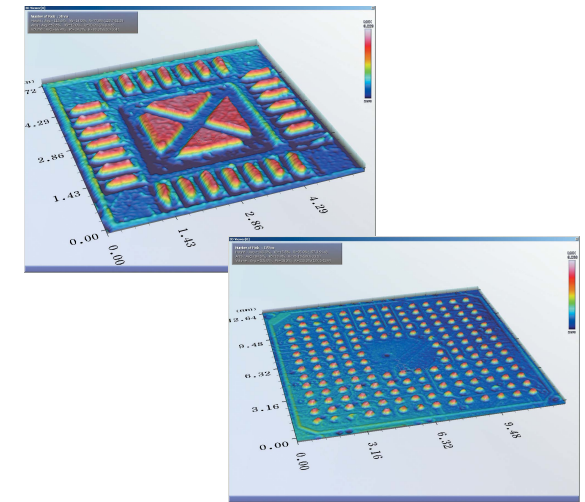


UI of Inspection Mode

Monitoring the printing process

3D shape viewer

After inspecting a PCB, the operators can designate some area to see the real 3 dimensional shapes. The area could be a pad location or a component location or even the entire PCB. Due to the vivid 3D shape, the operator can get meaningful information about the screen printer. The operator can track how shapes of solder pastes are changing according to the printer parameter changing such as the squeezing direction, squeezing pressure, snap-off distance, etc.

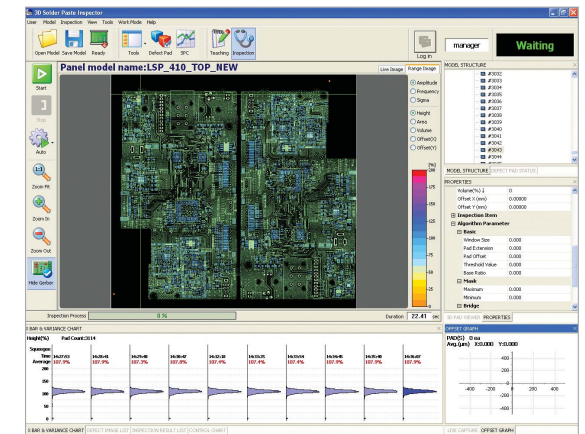


Monitoring printing status over all pads on the current PCB

The coloring pads locations according to the magnifications of measured data (Height, Area, Volume, offset) on every pad helps the operator to know status of printed solder pastes with ease. The operator can adjust printer parameters or give some treatment on the stencil mask until colors over entire paste locations become close to the green. Making a decision by seeing colors is very intuitive and straight forward.

Monitoring printing status over the recent PCBs

Two types of functions are supported to monitor printing process variation. For every pad location, standard deviations(Sigma) are calculated and all of the pads are colored according to the sigma values. The other function named X-bar & variance chart shows mean value and variance trend for selected pads in the 10 histogram graphs. Besides these functions, the fault frequency is also colored on every pad location to show how often the pad locations have made fault up to now. Operator's correct treatment could prevent defect and secure quality of printing process. We know that it is PARM's unique and elegant attitude to move one more step toward valuable and useful machine for customers.

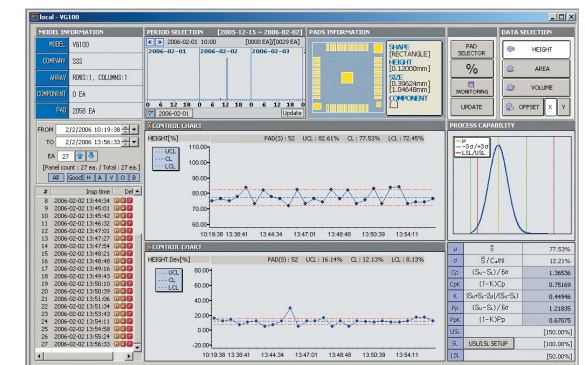


UI of Analysis Mode

Statistical Process Control

The SPI 50T system provides the powerful SPC program named SPCworks. All the measured data by the SPI 50T system are saved on the database in the SPI 50T control computer. The SPCworks is another windows application program with network connectivity to the database. The user can select panels by designating a period, and make a subgroup composed of some pads for the SFC analysis. The supported data types are height, Area, Volume, and positional offset. The supported tools in the SPCworks are as followings.

- X-bar and X charts
- Moving range, Range, and Sigma charts
- Histogram chart
- Numeric display for Process capability analysis
- Tolerance setting



UI of SPCworks