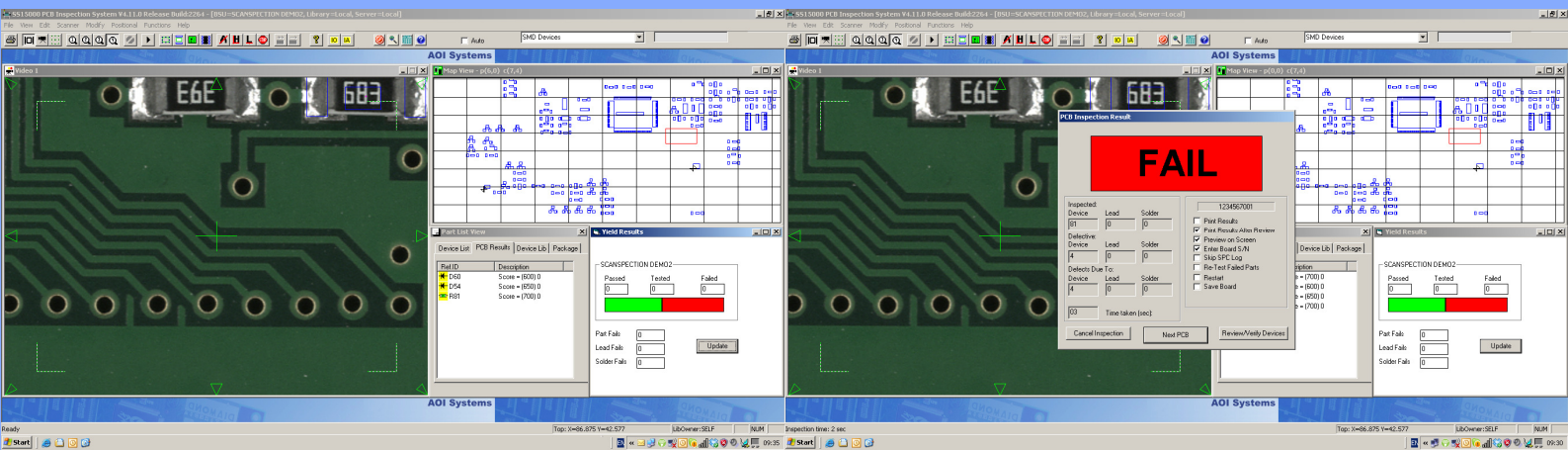# AOI Systems Limited
Automated Optical Inspection
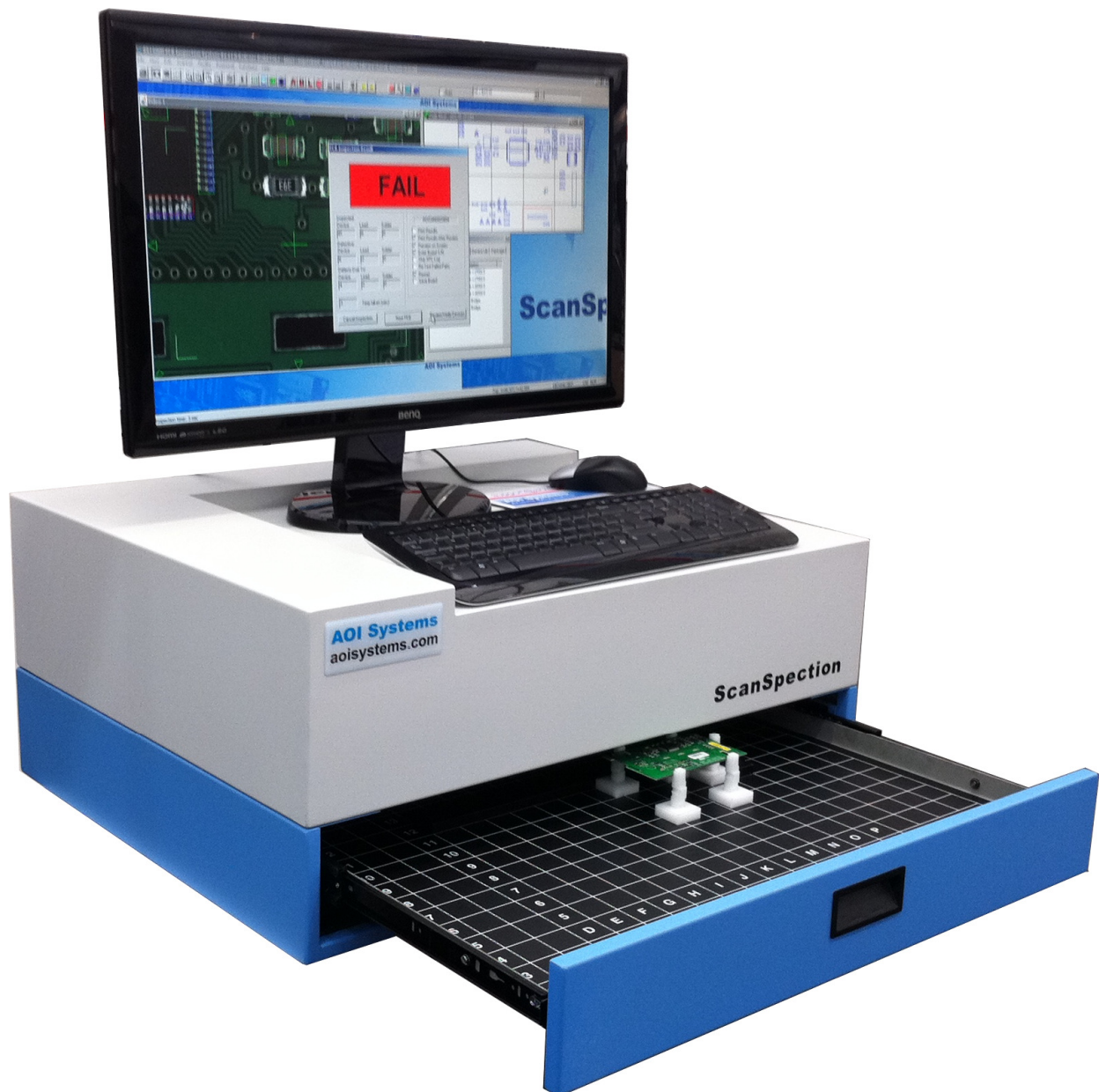

Automated Optical Inspection
SS15000PAL

Automated Optical Inspection

The economic realities of quality control, rework cost and need for customer confidence make Automated Optical Inspection (AOI) a necessity in Circuit Board manufacturing environments AOI can take a number of roles on the PCB production line. There are a number of "captive" applications such as accurate component positioning in the pick and place system, or screen checking in the paste printer, and there are also stand-alone functions to which AOI is ideally suited.

AOI Systems ScanSpection uses two basic algorithm groups to inspect component and soldering. The first algorithm checks the component related parameters, with these being entered to a Model training phase. The second algorithm group is for solder and lead inspection and offers the ability to use the optimum algorithm for the type of inspection to be carried out. In addition the solder inspection and lead inspection can be attached to a package type rather than component type to assist in programming.

ScanSpection SS15000PAL (Parts and Leads)

Desktop AOI using a high performance line-scan technology. The board is loaded and unloaded using the drawer facility allowing the operator to place the board on predefined blocks. optical alignment to on-board fiducials maintaining positional accuracy from board to board.

Faults reported to panel and board position. All faults can be stored with pictures for use with Scanspections Rework Software. Full fault classification facility for SPC analysis comes as standard. ScanSpections simple programming and user interface ensures that high quality programs can be quickly and easily created for production.

SPC Interface

Data generated can be processed for SPC analysis using either the XLS format or picked up by a predefined worksheet or database. The information is updated and saved using the same part number information as the board program.
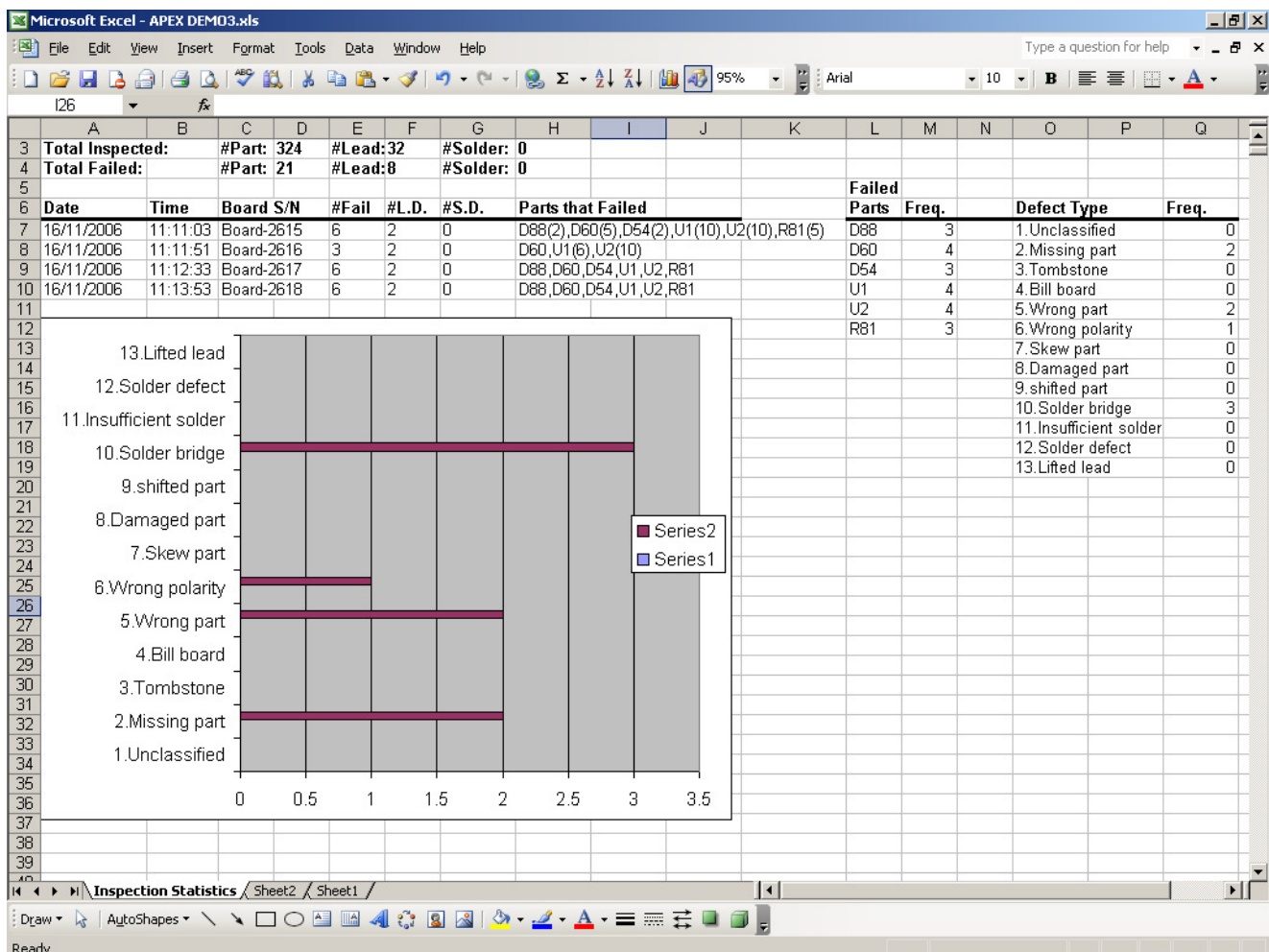
Board Testing in Operator Mode

This user friendly operator interface is so simple to use that training can be carried out in less than 30 minutes.

Automatic image adjustment removes the possibility of operator error as well as dramatically reducing set up times. A simple Green pass and Red fail quickly indicates suspect devices. The review mode allows closer examination and classification on the devices with the option of collecting the information for full SPC analysis.

The "Operator" environment Interacts with the rework server allowing offline rework for high volume applications.
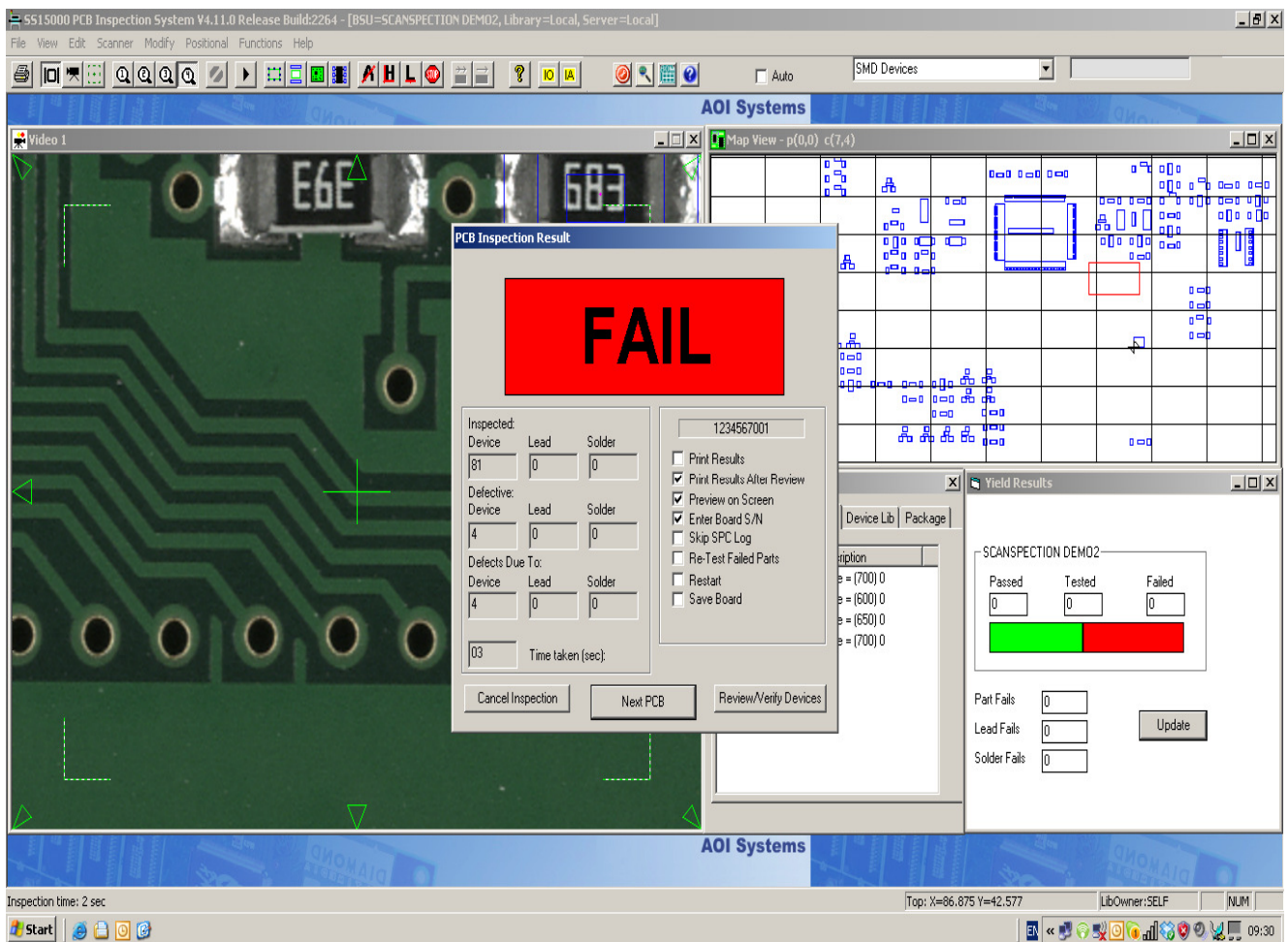
Typical Faults Found

Find Typical manufacturing defects - Shifted, Misplaced, Billboard, Tombstone, Bridging, Inverted, Wrong Polarity, Wrong Part, Missing , Bent Lead, Skewed and even Damaged.
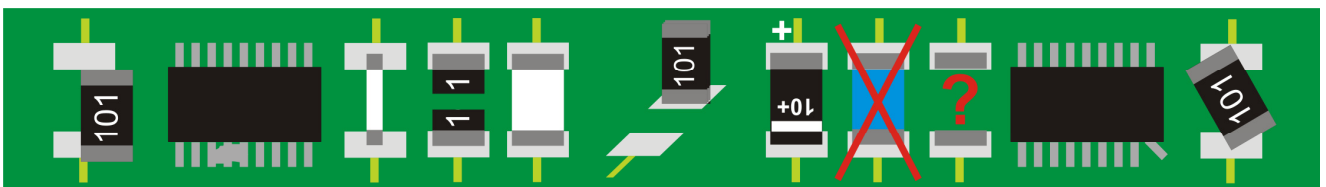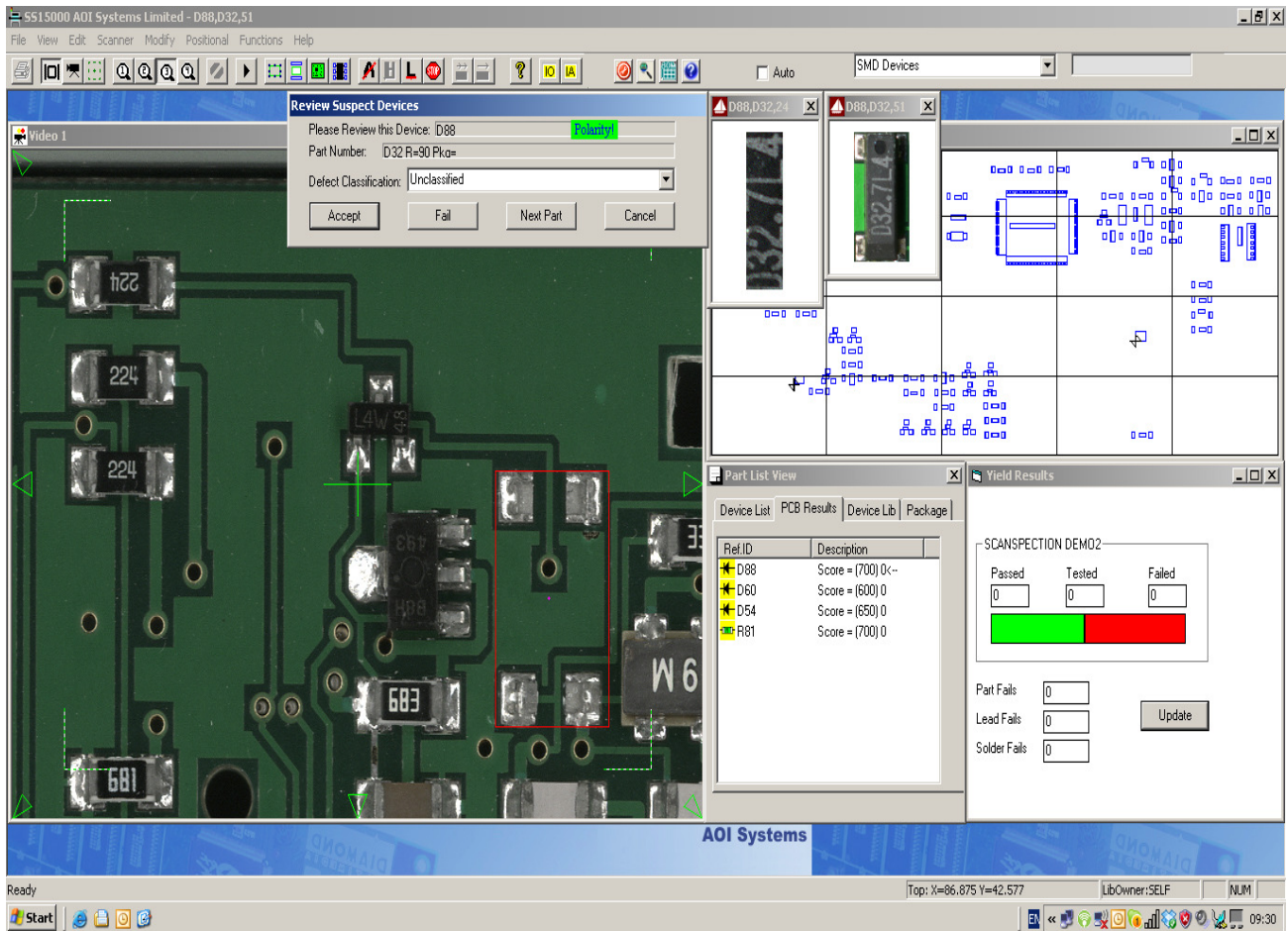
Classification of Faults

Simple user friendly pull down menu can be tagged to the fault allowing the easy classification and an understanding of the defect displayed.

Programming in Supervisor Mode

Supervisor mode is the user friendly application for the creation of test programs used in the "Operator" environment. By utilising the pick and place information or CAD, programs are created by importing the device placement data onto the board. Existing devices are automatically placed from the library and unknown devices require identification only once. 95% of programs are created using the mouse and short cut keys. High level board programs can be created in less the one hour.

CAD Import

The CAD import facility requires only basic placement Information such as Ref ID, Part No, Package Type, X, Y and rotation. Any adjustments to scaling, rotation, polarity and positioning can be adjusted using the correct fields in the CAD exchange file

Offline Programming

Offline programming and debug is made easy as ScanSpection software allows the actual board for test or debug to be saved in a TIFF format. The saved images and software are exactly the same as ScanSpections, making program creation and updates easy without impacting on the production schedule.
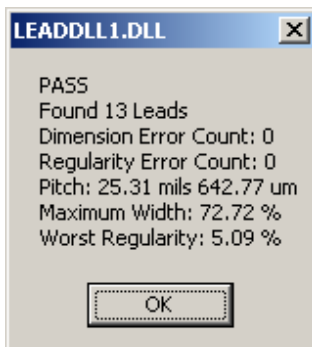
Feature Model Training

To inspect component related problems a "feature" is used for the parameters. This feature is learned from a good device and stored in the program and part library. The feature can be trained using fluorescent white lighting for printed and etched devices

Lead Inspection

Lead inspection algorithms are used to check for short circuits between the pins of a device, bent leads and shifted components. The parameters for the particular package style are then stored in the device library and again related to a component in the inspection program

LEADDLL1.DLL

PASS
Found 13 Leads
Dimension Error Count: 0
Regularity Error Count: 0
Pitch: 25.31 mils 642.77 um
Maximum Width: 72.72 %
Worst Regularity: 5.09 %

OK

AOI Systems - Specification

Specification

	A3 System	
Board Size	630mm x 495mm	
Inspection Area	420mm x 330mm	
Component Height	Up to 50mm	
Dimensions (mm)	700 x 555 x 305	
Cycle Time	Less Than 20 Seconds (High Speed Mode)	
Resolution	20 Micron Standard - 10 Micron Optional	
Lighting	Cold Cathode	
Power Require-ments	110.240 Vac 5/10 A	
PC	Windows 7 I5 Processor or Better (4Gb RAM)	
	200 Gb Hard Drive	
	Network Card	
	LCD Monitor	
Software	ScanSpection Comparator Software	
	ScanSpection AOI Software	
	CAD Viewer & BOM Software	
Options	Offline Programming	
	Offline Inspection	
	Offline Rework	
	First Article Inspection Software	

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