

# PowerSpector

GTAz, GTz, GDAz GDz  
Dual side Inline AOI



## In-Line DUAL side Automatic Optical Inspection systems

- ✓ Dual side inline full featured inspection
- ✓ High Speed 90Fps thunderbolt main camera and USB 3 Vision Cameras side cameras
- ✓ Synchronized top and bottom inspection
- ✓ Multi-color 4 angle lighting with Line Source Coaxial Lighting and Meniscus Profiler
- ✓ Inspects: .....
  - Components: SMT & THT (missing, type, polarity, offset, text, colors, etc.)
  - Component Height and Coplanarity
  - Solder Paste and CIP (Components in Paste; pre-reflow)
  - Soldering: Post Reflow, Post Wave, Selective, Manual
  - THT solder inspection
- ✓ Flexible classification and reporting scenarios.....
- ✓ Line Sourced DOAL(Direct On Axis Lighting) coaxial lighting system with high resolution Telecentric Optics.....
- ✓ Low Noise Large CCD High Speed 24 bit Color Camera
- ✓ Synthetic Imaging and Spectral Analysis.....
- ✓ Triple use of side camera's
- ✓ Prototype mode for 1st off inspection.....
- ✓ In height adjustable optical head

Featuring industry leading GTAz head and optional high clearance GDAz head

The latest generation of high speed, high quality cameras  
No capture card requirements.

Top and bottom heads are linked to allow parallel inspection cycles

reliable solder joint meniscus and pad surface analysis (to find meniscus and paste printing defects)

use inspection in all stages of the production process

integrate AOI efficiently in your existing operations and factory lay-out

inspect solder joints without shadow effects from tall components nearby and accurate inspection model building

find defects easier including printing defects on Gold or Cu plated PCB's

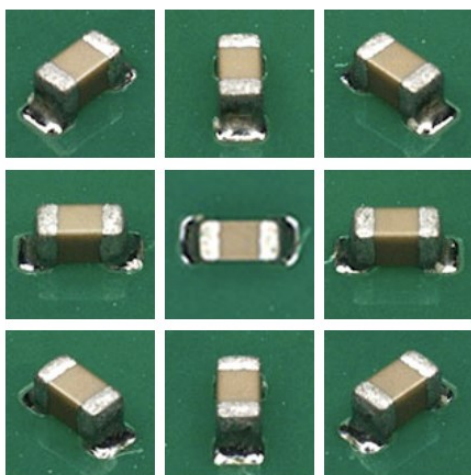
powerful algorithms to achieve an optimal balance between defect detection and false reject levels in shortest time

Use for automatic inspection, classification and repair

program in minutes to verify your production line is set-up correctly before starting full production

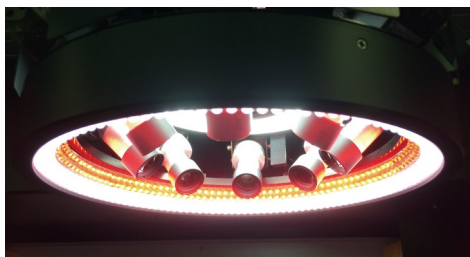
Compensate for PCB warp and adapt to tall component and sandwich assemblies

## Hardware and Software Features



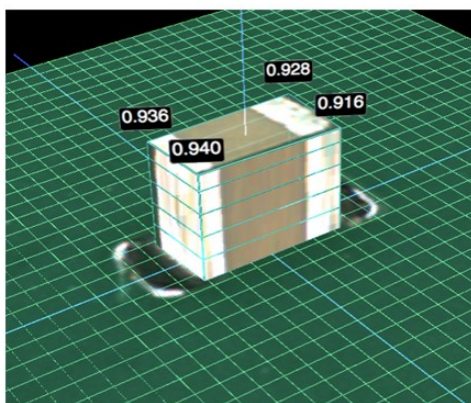
### Revolutionary 3D imaging On GTAz head

True Stereoscopic imaging using 9 cameras. Full colour 3D allows the ability to actually see the side of components rather than extruded 2D images. Using the addition of a 4th LED white light



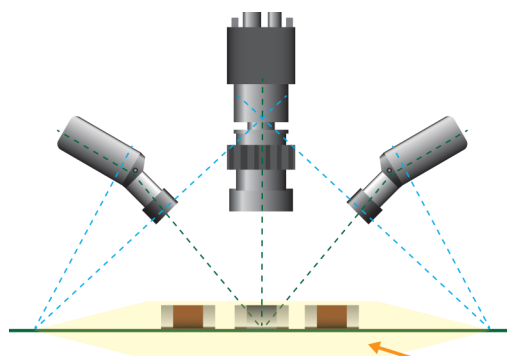
### The perfect combination of 3D and 2D inspection

Height, tilt and coplanarity measurement. Pin Height measurement Component Presence Absence, Polarity, Value, Angle, Offset, Colour, Extra part detection, Solder ball detection, Solder profile analysis and short detection. The thickness of chip capacitors in combination with colour makes a more reliable inspection when checking chip capacitors value.



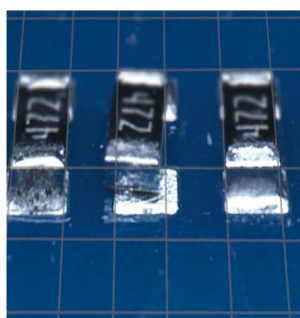
### Unique 3D Stereoscopic Vision

Utilizing the full 9 cameras of the MEK camera head. The image differential are merged and a vectorised map of the component is created. Then analyzed based on the programmers applied tolerances. The vectorized map of the components removes the minor imperfection of the component surface giving more accurate measurement of height and surface angle of the component with reduced chance of false readings.

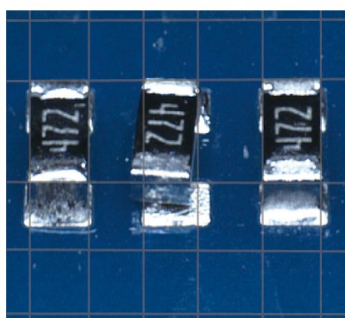


### 8x Angular Side Sensors (Only available for GTAz and GDAz models)

Simultaneously operating, multiplexed side view sensors with CameraLink interface — 45/45 arrangement — Triple use: Active automatic inspection, classification and repair — clear 9 angles defect review — high magnification 50x (10µm/pixel) — Full Color — Auto highlight — Large sensor pixels — 9 view images also in backup database



Without Shift&Tilt



Shift&Tilt

### Shift & Tilt Side View lenses

Distortion free side images across whole FoV. Every point on the PCB within the FoV has same distance to the capturing sensor despite the angle of the optics

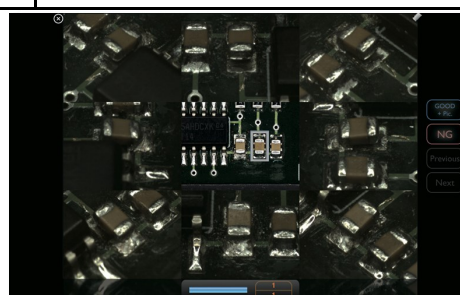
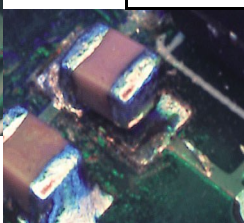
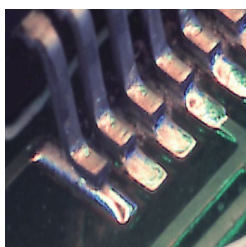
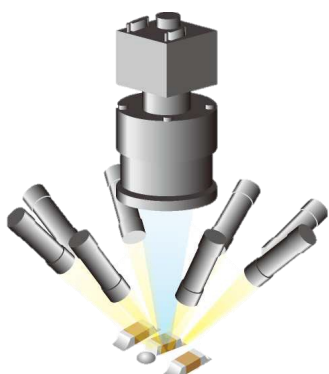
### The GDAz and GDz

Heads provide an extended over board clearance of 60 mm (2.4") Allowing for taller THT component inspection on an inline system

### Sixteen possible head combinations

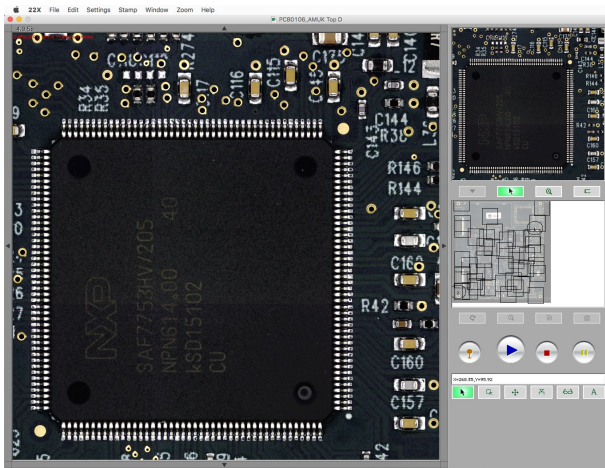
18 Camera, 9 Top and 9 Bottom Cameras to 2 Camera Single top and Bottom Cameras. The D22X BTL is the ultimate in platform flexibility

GTaz	30mm clearance, Passive 3D SMT
GDAz	60mm Clearance SMT and THT
GTz	35mm Clearance SMT and THT
GDz	60mm+ Clearance SMT and THT





## Hardware and Software Features — Continued

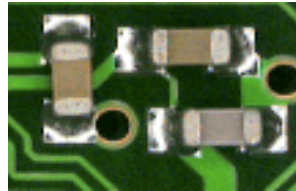


### Double size FOV (Field of view)

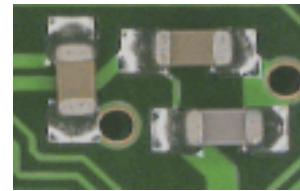
Up to 2x faster inspection over previous generations of machines. Square FOV combined with circular lighting allows for program rotation without time consuming debugging.

### Large pixel image capturing sensor

18.8 $\mu$ m<sup>2</sup> pixel size — less noise — smooth and detailed image— great dynamic range



High dynamics sensor



Conventional sensor

### In Height Adjustable Optical Head

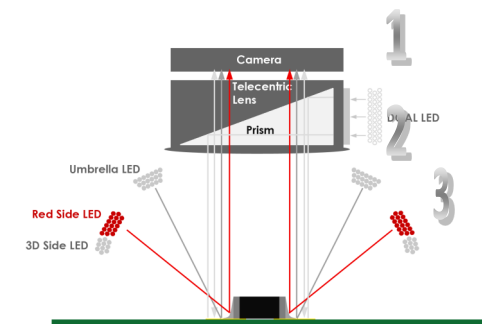
In Z-Axis moving Top Camera, Light and Side View cameras — Adaption to any PCB Thickness — PCB Warp Compensation — Inspection of PCB's with very tall components — Reliable text and/or polarity inspection on tall components Inspection of "Sandwich" assemblies without need of jigs and multiple inspections

### Omnidirectional multi angle, multi color LED lighting

Optimal light no matter component direction — 3D color profile of solder meniscus — Reliable defect decision by the software — Decide Good Solder, No Solder, Lack of Solder and Too much solder for SMT and THT solder joints

### SMT Solder Inspection

Full solder profiling and histogram algorithm analysis. Simple prebuilt solder inspection libraries



### 90° co-axial light through prism



### 45° side light



### 65° main light

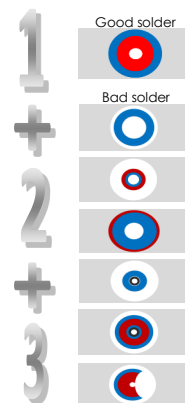
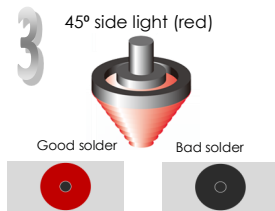
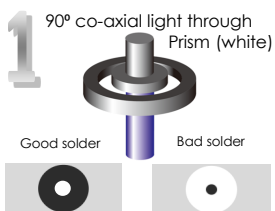


### 90° + 65° + 45° Meniscus Profiler

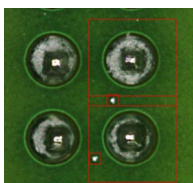


### THT Solder Inspection

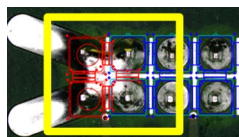
Scalable inspection points for the wide variety of Solder land shapes and pin sizes, Bridge and solder ball detection algorithms.



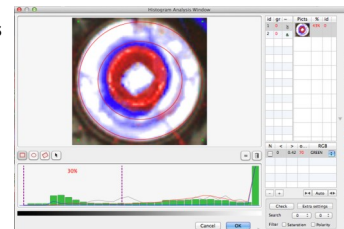
**Powerful algorithms for solder bridge detection**  
Simple and scalable



**Dedicated algorithms for solder balls detection**



**Histogram Analysis algorithms**  
Condition based decision  
Tolerances can be set tightly  
Close to zero false alarms



# Inline

# PowerSpector

## GTAz+GDAz

## 350BTL, 550BTL

In-Line Series Specifications	PowerSpector GTAz/GDAz 350BTL	PowerSpector GTAz/GDAz 550BTL
Maximum PCB Size	350x250mm (13.8"x9.8")	550x550mm (21.6"x21.6")
Characteristics		
Product type	Automatic Optical Inspector	
In-line/Off-line	In-Line	
Camera movement	X + Y Direction	
PCB movement	Stationary during inspection	
Parts inspection	Presence, Polarity, Offset, Correctness, Soldering, Height	
Printing/paste inspection	Offset, Smearing, Bridges, Uniformity	
Image Processing	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Image Parameters	Brightness, Hue, Saturation via Filters	
Camera type	Digital color Thunderbolt interface 90 Fps	
Camera Field Of View/Resolution	38.5x38.5mm/18.75µm or 19.5x19.5mm/10µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Lighting system	Omnidirectional T Quad LED rings: Side White, Side Red, Main, Line Sourced DOAL (Diffused On Axis Lighting (Coaxial))	
Specifications		
Minimum inspection component size	01005" (0.4x0.2mm)(10µm resolution)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance (top)	GTAz 30mm (1.2") GDAz 60 mm (2.4")	
Side Cameras	8x Digital color USB 3.0 Vision in 45/45 orientation	
Z-Axis movement range	30mm (1.2")	
Component clearance (bottom)	30mm (1.2") with GTAz bottom camera or 60mm (2.4") GDAz bottom camera	
Maximum PCB Size	350x250mm (13.8" x 9.8")	550x550mm (21.6" x 21.6")
Movement speed	720mm/s	
Inspection capacity typical	2750ppm	
Electrical requirements	100-240 VAC / 330W	
Conveyor		
Conveyor belt speed	10-500mm/s (0.4-19.7"/s)	
Conveyor configuration	Left>Right, Front rail fixed, Height 830-950mm	
PCB Clamping	Top Justified, Ruler Blade, Top & Edge Clamping, Sensor Stopper	
Minimum board size	50x50mm (2.0" x 2.0")	
Board thickness	0.6-4mm (24mils - 79mils)	
Interfacing		
Control PC type	Apple Mac Mini or iMac x2	
Control interface	SMEMA (conveyer)	
Data interface	USB and Thunderbolt	
Programming Interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (Windows 7/8/10) (option)	
3rd party Interfacing (MES) & Data Storage	Enterprise SQL DB/XML Files/Socket (Catch System Option)	
General		
Operating temperature	15-30 deg. C(60-90 deg. F)	
Operating humidity	15-80 % RH	
External size	W740 x D786 x H1236 (29.1" x 30.9" x 48.7")	W1078 x D1320 x H1317 (42.4" x 52" x 51.8")
Weight	240ka (397lbs)	400ka (529lbs)

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because inspection matters

# Inline

# PowerSpector

## GTz+GDz

### 350BTL, 550BTL

In-Line Series Specifications	PowerSpector GTz/GDz 350BTL	PowerSpector GTz/GDz 550BTL
Maximum PCB Size	350x250mm (13.8"x9.8")	550x550mm (21.6"x21.6")
Characteristics		
Product type	Automatic Optical Inspector	
In-line/Off-line	In-Line	
Camera movement	X + Y Direction	
PCB movement	Stationary during inspection	
Parts inspection	Presence, Polarity, Offset, Correctness, Soldering, Height	
Printing/paste inspection	Offset, Smearing, Bridges, Uniformity	
Image Processing	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Image Parameters	Brightness, Hue, Saturation via Filters	
Camera type	Digital color Thunderbolt interface 90 Fps	
Camera Field Of View/Resolution	38.5x38.5mm/18.75µm or 19.5x19.5mm/10µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Lighting system	Omnidirectional T Quad LED rings: Side White, Side Red, Main, Line Sourced DOAL (Diffused On Axis Lighting (Coaxial))	
Specifications		
Minimum inspection component size	01005" (0.4x0.2mm)(10µm resolution)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance (top)	GTaz 30mm (1.2") GDaz 60 mm (2.4")	
Side Cameras	NA	
Z-Axis movement range	30mm (1.2")	
Component clearance (bottom)	35mm (1.2") with GTz bottom camera or 60mm+ (2.4") GDz bottom camera	
Maximum PCB Size	350x250mm (13.8" x 9.8")	550x550mm (21.6" x 21.6")
Movement speed	720mm/s	
Inspection capacity typical	2750ppm	
Electrical requirements	100-240 VAC / 330W	
Conveyor		
Conveyor belt speed	10-500mm/s (0.4-19.7"/s)	
Conveyor configuration	Left>Right, Front rail fixed, Height 830-950mm	
PCB Clamping	Top Justified, Ruler Blade, Top & Edge Clamping, Sensor Stopper	
Minimum board size	50x50mm (2.0" x 2.0")	
Board thickness	0.6-4mm (24mils - 79mils)	
Interfacing		
Control PC type	Apple Mac Mini or iMac x2	
Control interface	SMEMA (conveyer)	
Data interface	USB and Thunderbolt	
Programming Interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (Windows 7/8/10) (option)	
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General		
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