mek®
marantz electronics ltd

because inspection matters

Products Catalogue

2019-2020

Introduction

Mek (Marantz Electronics) is a leading supplier of 3D Automated Optical Inspection (AOI) and Solder Paste Inspection (SPI) technologies for advanced PCB inspection, test and measurement.

Well known for high quality Audio/Video products, Marantz, then part of Philips, developed its first AOI system in 1994 for use in Marantz's own factories. We launched our first-generation commercial system in 1996. Since this time our range has expanded with innovative desktop AOI, inline AOI, THT AOI and full 3D AOI systems.

We pioneered the 24-bit imaging technology that provides powerful process control and maximises production yields for companies involved in electronics assembly and microelectronics and now have over 8000 machines installed worldwide. Supporting these systems is a global network of suppliers to ensure that initial integration is straightforward, and ongoing machine support is in place to ensure process yields are optimised.

We continue to focus on delivering world-class products and this brochure introduces you to the key products in our range.

Mek (Marantz-Electronics)

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MADE IN JAPAN

Our timeline
Journey

1994
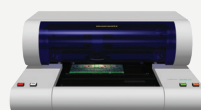Developed first AOI system to inspect PCB for use in Marantz's own factories.

1997
Established Mek (Marantz Electronics) Ltd. in Sagamihara city, Kanagawa prf.

2000
Introduced digital camera.

2002
Released M22X Fv series.

2005
Released M22X DL series.

1996
Released the first-generation commercial table top AOI machine as M22X.

1999
Released Inline AOI.

2001
Opened European office under the name of Marantz Business Electronics. HQ in The Netherlands.

2003
Worldwide installations achieved 2,000 machines.

2008
Released PowerSpector HDL series. Worldwide installations achieved 4,000 machines.

**CELEBRATING
OF EXCELLENCE
IN AOI**

25 YEARS
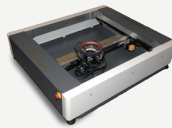
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2009
Released CATCH system, networking and process control software.

2011
Marantz Business Electronics became MEK Europe.

2014
Established MEK Americas Released SpectorBOX Bottom Up AOI module for 3rd party integration into production lines.

2016
Released Bottom & Top parallel synchronized AOI for THT.
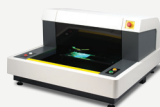
2018
Launched PowerSpector BTL, dual inline AOI for SMT. Worldwide installations achieved 8,000 machines.

2010
Released ISO-Spector SPI Solder Paste Inspection machine.

2012
Released PowerSpector F series with 8 angular cameras and Z axis. Released iSpector Desktop Entry-level AOI.

2015
Released the PowerSpector G series.

2017
Launched ISO-Spector M1, Full 3D AOI system with Artificial Intelligence.

2019
Our focus over the coming years: Compact Bottom-Up 3D inspection solutions SMART factory integration Inline THT AOI.

CELEBRATING OF EXCELLENCE IN AOI — **25 YEARS** — **mek**

Table of Contents

ISO-Spector M1A / M1

World's most advanced high-speed
3D Artificial Intelligence solder joint AOI

One of the greatest challenges in programming AOI systems is the detection of all non-conforming placements, especially those related to solder joints, without creating a long list of ''False Calls'' or spending lots of time on debugging and complex programming.

The full 3D ISO-Spector M1A delivers a self-learning algorithm for solder joint inspection that detects any deviation outside the expected standard appearance of a solder joint. The Artificial Intelligence is continuously and centrally monitoring production and adjusting hundreds of tolerance values, where needed, to maximize detection and minimize false calls.

The programmer does not have to specify the package types or acceptance criteria. This not only reduces programming time, but more importantly removes the often-unpredictable human variable to ensure that the inspection results are more reliable.

→ Automatic Full profile 3D AOI

→ Automatic/Adjustable tolerance settings

→ Programme-independent solder joint inspection

→ 25 Mega pixel main camera

→ Multiple side view cameras

→ Solder inspection based on Artificial Intelligence

→ Full integration to the FIBER system for classification, repair, traceability and SPC

→ Offline Programming/ Debug Station

→ Unrivalled 25mm (1") component height measurement
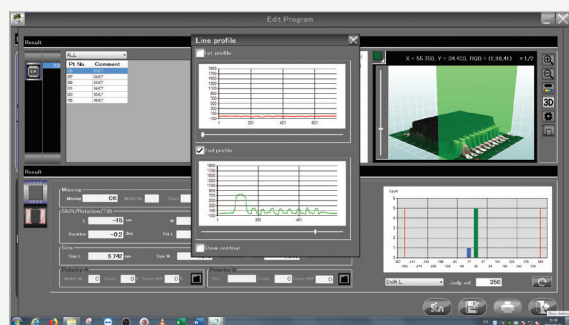
Inline PowerSpector GTAz/GDAz

In-Line Automatic Optical Inspection systems

Mek Inline AOI systems can be easily positioned to fully integrate with your SMT assembly line and will directly identify errors and emerging process trends. Refining even the most complex process, they deliver optimal productivity for every electronics manufacturing environment.

Designed for maximum defect coverage whilst maintaining short programming times. They can be equipped with 9 cameras: 1 top and 8 side cameras. The new GDAz/GTAz series targets inspection of taller THT components with a top clearance of 60mm and side cameras with a larger Field of View and 20μm resolution.

PowerSpector reliably inspects component bodies for presence/absence, type, polarity, offset, text, colours etc. and components solder fillets for excessive, insufficient, no solder, shorts & lifted leads. Suitable for use in pre-reflow, post-reflow, post-wave and post-selective soldering, it can also be used for 2D solder paste inspection and first article inspection.

→ 9 views simultaneous inspection

→ Passive 3D measurement on chip components

→ Multi-color 4 angle lighting with Line Source Coaxial Lighting and Meniscus Profiler

→ Flexible classification and reporting

→ Low Noise Large CCD High Speed 24 bit Color Camera

→ Synthetic Imaging and Spectral Analysis inspection algorithms

→ Triple use of side camera's: inspection, classification and rework

→ Prototype mode for 1st off inspection

→ Height adjustable optical head (XYZ moving optics)

→ 2D solder paste inspection capability
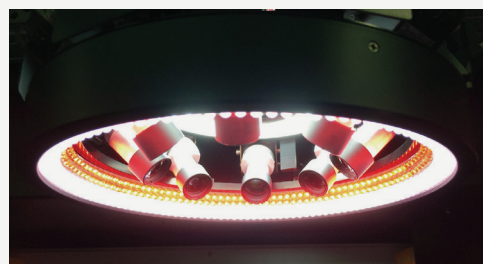
Desktop PowerSpector GTAz/GDAz

AOI system with ultimate flexibility, for SMT, THT and more

Mek PowerSpector desktop AOI systems are the only desktop AOI in the market that can be equipped with 9 cameras: 1 top and 8 side cameras. For maximum flexibility, the optical unit is configurable to fit your needs today while providing upgrade possibilities for the future.

GTAz/GDAz AOI systems are the most versatile inspection engines, reliably inspecting SMT and THT component bodies for presence/absence, type, polarity, offset, text, colours etc. and components solder fillets for excessive, insufficient, no solder, shorts, lifted leads etc. Suitable for use in pre-reflow, post-reflow, post-wave and post-selective soldering, they can also be used for 2D solder paste inspection and first article inspection.
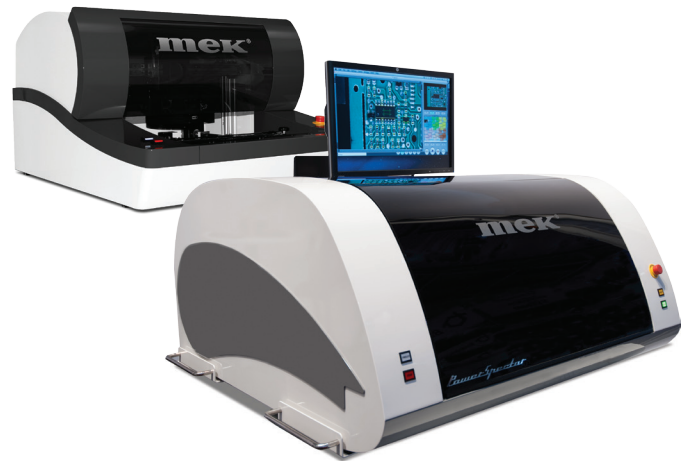
→ 9 views simultaneous inspection

→ Passive 3D measurement on chip components

→ Multi-color 4 angle lighting with Line Source Coaxial Lighting and Meniscus Profiler

→ Available in 4 different sizes: M, L, XL and XXL

→ Low Noise Large CCD High Speed 24 bit Color Camera

→ Synthetic Imaging and Spectral Analysis

→ Triple use of side camera's: inspection, classification and rework

→ Prototype mode for 1st off inspection

→ Height adjustable optical head (XYZ) moving optics
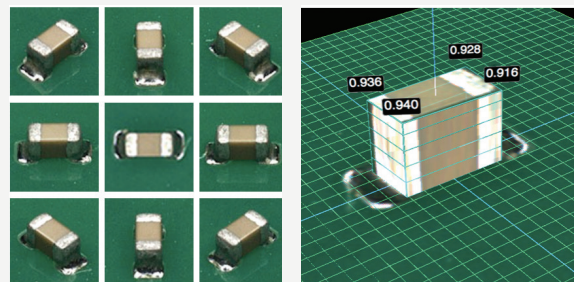
PowerSpector

PowerSpector BTL

In-Line DUAL side Automatic Optical Inspection system for simultaneous bottom & top inspection of PCBs

Mek PowerSpector BTL AOI system delivers synchronized inspection of the top and bottom side of PCBs after Reflow, Wave or Selective soldering & placement of SMT & THT components.

Patented synchronized lighting technology brings new capabilities. 9 cameras per side, with both heads inspecting the PCB at the same time, deliver fastest inspection times but without the high power lighting system of each head affecting the other inspection taking place. The elimination of flipping removes potential for stress on the assembly and improves long term reliability of solder joints. Integrate inspection into all stages of the production process for total process optimization.

→ Dual side inline full featured inspection

→ Features industry leading GTAz head and optional high clearance GDAz head

→ High speed, high quality cameras. No capture card requirements

→ Multi-color 4 angle lighting with Line Source Coaxial Lighting and Meniscus Profiler

→ Flexible classification and reporting

→ 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

→ Height adjustable optical head
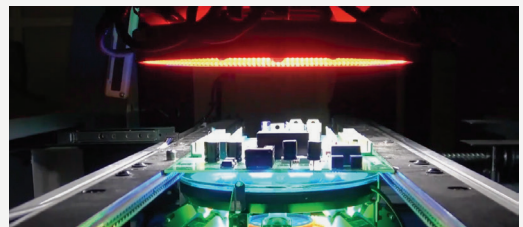
SpectorBOX

SpectorBOX Modular AOI

Bottom-up & top-down modular AOI

The Mek SpectorBOX modular AOI platform is optimized for the inspection of Wave & Selective soldering of THT & surface mount components. Also for inspection of conformal coating. It is designed to inspect PCBs inside solder frames, directly from the conveyor system.

The system offers bottom side, top side or simultaneous dual side inspection, deploying up to 18 cameras, Z axis positioning and auto-focus. The design is optimized for the inspection of THT components to identify defects such as presence/absence, wrong polarity, colour, type, and bent pins.

SpectorBOX can be simply interfaced with existing or new conveyor systems. The Nutek Main Frame allows easy integration of one or two SpectorBOX modular AOI systems into the production line. It is a cost effective way to combine Bottom-Up and/or Top-Down inspection.
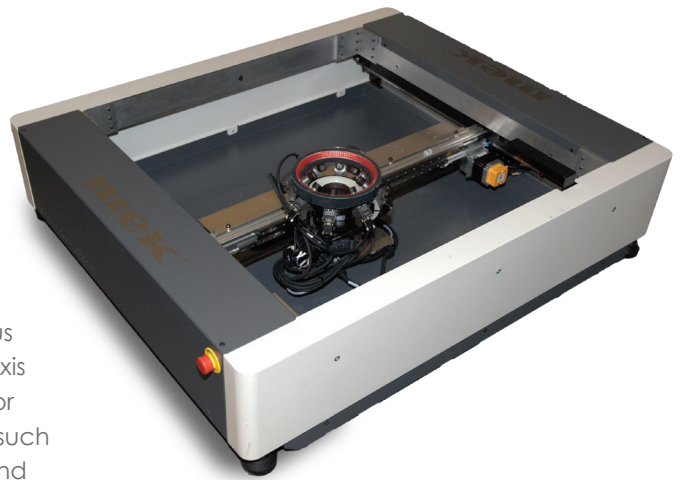
→ Optimized for THT Components- and Post Wave and Selective Soldering Inspections

→ Bottom-up and/or Top-down Inspection

→ Solder Frame Compatible

→ Modular Inspection Possibilities: Bottom, Top or Top + Bottom

→ Main Frame Compatibility

→ Up to 18 Cameras

→ In Z-Axis Moving Optical Head(s)

→ General Purpose I/O

→ Post Defect Classification and Reporting

Note Also available with UV optics for conformal coating inspection

SpectorBOX

SpectorBOX Main Frame by Nutek

Combined bottom-up and/or top-down inspection

The Nutek Main Frame is a turnkey AOI solution allowing easy integration of one or two SpectorBOX modular AOI systems into the production line. It is a cost effective way to combine Bottom-Up and/or Top-Down inspection.

Built for flexibility, it can be configured to the output of any wave or selective soldering system. The ergonomic design is optimized for operators to have eye-height monitors as well as wrist height keyboard and mouse control. Operation is easy, whether in a standing or seated position, even when dual SpectorBOXes are in use via double monitor configuration. A manual mode allows for smooth offline programming preparation.

→ Turnkey solution for Feed & Return Conveyers

→ Top side THT Component Inspection

→ Bottom side Selective Soldering Wave Soldering

→ Top & Bottom side Full assembly inspection

→ Maintenance friendly

→ Ergonomic operation
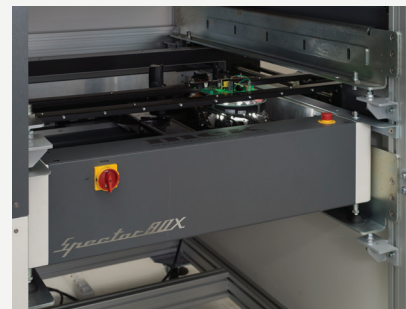
iSpector JK

Entry Level AOI

For customers for whom value for money is an absolute priority the new iSpector JK desktop AOI system is designed to inspect component bodies and solder joints by use of RGB LED light sources from three different angles offering full inspection coverage at an entry level price. Powerful algorithms achieve an optimal balance between defect detection and false reject levels in the shortest time.

It reliably inspects SMT component bodies for presence/absence, type, polarity, offset, text, colours etc. and components solder fillets for excessive, insufficient or no solder, shorts, lifted l eads etc. Suitable for use in pre reflow, post reflow, post wave and post selective soldering, it can also be used for first article inspection.
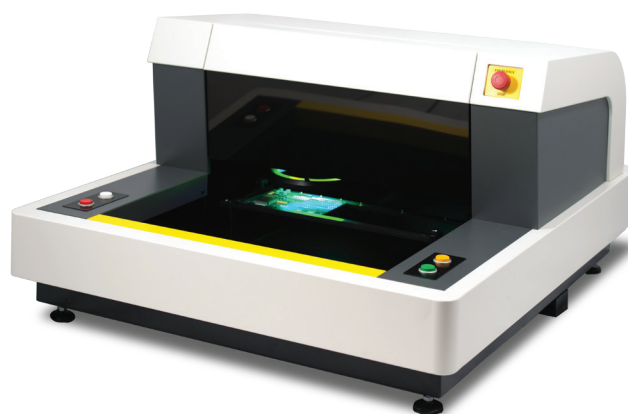
→ Automatic Optical Inspection of PCB assemblies

→ Comprehensive and easy to use online training suite

→ Low Noise Large CCD 24 bit Colour Camera High Speed USB3 Vision interface

→ RGB angular lighting system with 3D Meniscus Profiler

→ Programmable from library or Golden Components

→ Prototype mode for 1st off inspection
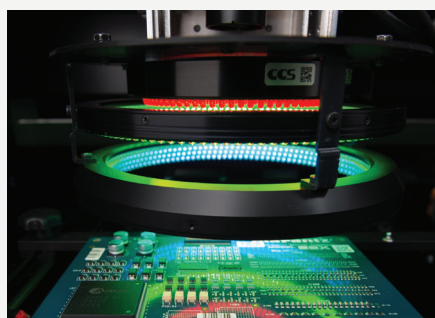
iSpector JDz

Entry Level AOI

Mek iSpector JDz delivers the fastest return on investment for EMS customers that seek optical flexibility, easy programming & usage and the highest inspection performance guarantees.

Available as Desktop or Inline the JDz uses a Z-axis for maximum flexibility in THT and sandwiched SMD inspection. The Z-axis enables inspection of objects at different height levels such as sandwiched PCB's, tall components or positional measurement of tall connector pins.

This flexibility, combined with fast software programming times, result in the perfect AOI system for customers with low volume, high mix production requirements looking for high-quality AOI with a low price tag.

→ Automatic Optical Inspection of PCB assemblies

→ High Speed inspection

→ Powerful algorithms to achieve optimal balance between defect detection and false reject levels in shortest time

→ Flexible classification and MES integration

→ Comprehensive and easy to use online training suite

→ RGB angular lighting system with 3D Meniscus Profiler

→ Low Noise Large CCD 24 bit Colour Camera

→ Programmable from library or Golden Components

→ Prototype mode for 1st off inspection

ISO-Spector S2

5D Solder Paste Inspection Systems

Mek ISO-Spector S2 5D SPI is a new breed of powerful process control tool, which enables manufacturers to quickly and easily tune and adjust their print process.

The patented 5D inspection sensor technology allows for simultaneous capture of colour 2D imaging and accurate and repeatable 3D measurement using a single sensor; high speed capture with switchable resolution on the fly; shadow free measurements using dual combined 3D and 5D image processing; inspecting beyond the Aperture; inspection of volume, area, height offset, bridge, slumping and detection of anomalies in printing. The result is the ability for defect detection beyond that previously possible.

The system connects seamlessly to most printers and programs are easily adjusted to meet on the fly adjustments.

→ Solder Paste defect detection with combined 3D and 2D technology

→ 12MP camera with 18/9 Micron optional 12/6 micron for 008003 pad geometries

→ Telecentric Blue/ Violet lasers for higher pixel stability and higher accuracy and repeatability

→ Topographical 3D zero referencing

→ Shadow free measurement – Both accuracy and precision
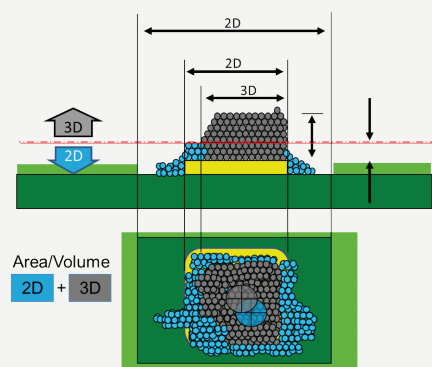
iSpector JUz (also available as SpectorBOX JUz)

Conformal Coating AOI

Mek iSpector JUz is the ultimate solution for conformal coating inspection. It can be used after manual spray, automatic spray and dip coating applications.

The system is able to provide coating defect detection covering the components and around the components. Bubbles and other contaminations can also be detected.

Unique algorithms and dedicated strategies allow easy and fast programming with high detection coverage.
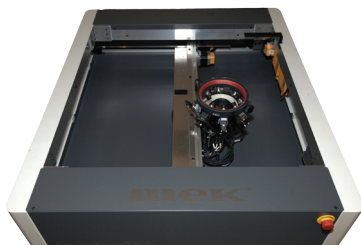
→ Automatic Optical Inspection of Coated PCB's

→ High Speed inspection

→ Coating on component, around component and on PCB coverage

→ Powerful algorithms to achieve optimal balance between defect detection and false reject levels in shortest time

→ Flexible classification and MES integration

→ Comprehensive and easy to use online training suite
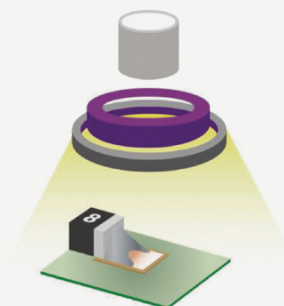
Yield Enhancement Software

Ultimate Production Monitoring and Connectivity Software

Mek connectivity and yield enhancement software allows for complete process control and tracking.

By using comprehensive data collection and storage, Mek's connectivity and yield enhancement software allows users to analyse defects and process points to improve and solve production issues. Data collection is achieved using barcodes and serial numbers and all defect data is available in an SQL or XML archive for rework and SPC.

Mek's process control system, can network multiple Mek AOI machines into a completely closed loop process monitoring and quality control system uniquely optimised for each user's workflow and internal organization.

Mek's connectivity and yield enhancement software includes the option to connect the Mek ISO-Spector Solder Paste Inspection (SPI) system and the Full 3D AOI systems to allow users to determine the origin of defects that appear at the end of the production line.
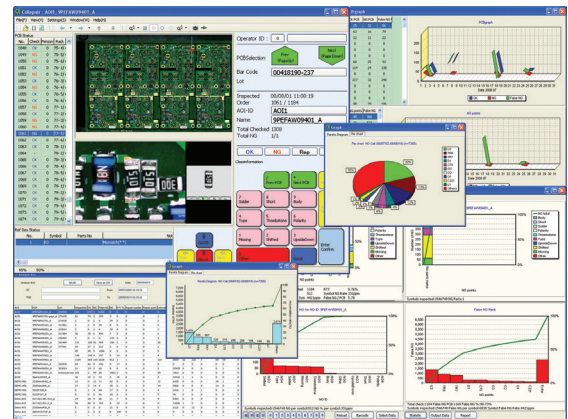
→ Managing huge data quantity

→ Generate XML/SQL output for third-party data management solutions

→ Easy route to 'cause finding' to prevent defects from occurring in the future

→ Live detailed feedback

→ Simple to understand charts, histogram and transition charts

→ Process control to gain optimal print results

SPI   AOI   AOI
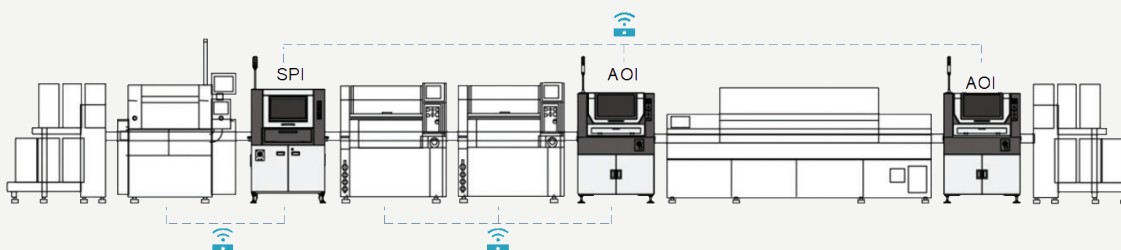
ISO-Spector M1A / M1

Full 3D AOI

ISO-Spector M1 (Inline)	ISO-Spector M1 (Inline)	ISO Spector M1A (Inline)
Maximum PCB Size	510mm x 680mm (20" x 26")	350mm x 680mm (14" x 26")
Characteristics		
Product type	Topographical 3D Automatic optical inspection and measurement	
In-line	Inline SMEMA 2.0	
Movement type	Camera X,Y	
PCB movement	Stationary	
PCB fixation	Top Clamping, Pin based PCB support	
Parts inspection	Solder filet, lead open, coplanarity, part missing, skew, polarity, foreign material, OCV, OCR	
3D capture	Multi-source Moiré	
2D capture	Multi angle multi light High intensity LED	
Camera type	25MP (5000 x 5000)	
Camera Field Of View	69mm x 69mm (2.72" x 2.72")	
Lens	High Resolution custom Telecentric	
Side Cameras	No	Yes
Specifications		
Minimum inspection component size	0402 metric (01005")	
Component clearance (top)	+55mm (2.2")	
Component clearance (bottom)	-50 (-2")	
Minimum PCB Size	50x50mm (1.9" x 1.9")	
Warp compensation	±5 mm (± 0.2")	
Inspection capacity typical	3600mm2/s in full 3D/2D	
Power	100-240 Vac / 1.5 kVa single phase	
Interfacing		
Control PC type (included)	Industrial grade Windows PC	
Control interface	Custom control card	
General		
Operating temperature	15-35°C (60-95 F)	
Operating humidity	15-85 % RH	
External size	W1070x D1550 x H1500 mm (42" x 61" x 59")	W1070x D1550 x H1500 mm (42" x 61" x 59")
Weight	800kg (1760bs	830kg (1830lbs)

Inline PowerSpector GTAz/GDAz

350L, 650L, 800L

In-Line Series Specifications	PowerSpector GTAz 350L	PowerSpector GTAz 650L	PowerSpector GTAz 800L
Maximum PCB Size	350x250mm (13.8" x 9.8")	650x550mm (25.6"x21.6")	800x550mm (31.5"x21.6")
	Note: GDAz Max. PCB Size is slightly smaller due to larger diameter optical unit		
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(1.52"x1.52")/18.75µm or 19.5x19.5mm(0.77"x0.77")/10µm		
Lens	Telecentric lens with built in prism for DOAL Lighting		
Lighting system	Omnidirectional 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 60mm (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)	35mm (1.38") or 55mm (2.17") without PCB support lift option		
Movement speed	720mm/s		
Inspection capacity typical	2750ppm		
Electrical Requirement	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	0.6-2mm (option 0.6-4mm) (24mils - 79mils)		
PCB warpage compensation	Automatic PCB support Lift with magnetic pins (option)		
Interfacing			
Control PC type	Apple Mac Mini or iMac		
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")	W1040 x D1077 x H1270 (40.9" x 42.4" x 50.0")	W1190 x D1077 x H1259 (46.9" x 42.4" x 49.5")
Weight	180kg (397lbs)	240kg (529lbs)	290kg (639lbs)

Desktop PowerSpector GTAz/GDAz

350, 520, 650, 800

Desktop Series Specifications	PowerSpector GTAz 350	PowerSpector GTAz 520	PowerSpector GTAz 650	PowerSpector GTAz 800
Maximum PCB Size	350x250mm (13.8" x 9.8")	520x460mm (20.5"x 18.1")	650x550mm (25.6" x 21.6")	800x550mm (31.5"x21.6")
	Note: GDAz Max. PCB Size is slightly smaller due to larger diameter optical unit			
Characteristics				
Product type	Automatic Optical Inspector			
In-line/Off-line	Off-Line			
Camera movement	X Direction	X + Y Direction	X + Y Direction	X + Y Direction
PCB movement	Moving in Y	Stationary	Stationary	Stationary
PCB fixation	Direct Loading	Direct Loading	Manual Drawer Options: Motorized Drawer, Transverse loader	Manual Drawer Options: Motorized Drawer, Transverse loader
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(1.52"x1.52")/18.75µm or 19.5x19.5mm(0.77"x0.77")/10µm			
Lens	Telecentric lens with built in prism for DOAL Lighting			
Lighting system	Omnidirectional 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 60mm (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)	70mm (2.8")	70mm (2.8")	70mm (2.8")	70mm (2.8")
Movement speed	720mm/s			
Inspection capacity typical	2750ppm			
Electrical Requirement	100-240 VAC / 150W			
Interfacing				
Control PC type	Apple Mac Mini or iMac			
Data interface	USB and Thunderbolt			
Programming Interface	CSV Centroid File (Placement Data)			
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	W736 x D874 x H450 (29.0" x 34.4" x 7.7")	W1110 x D1040 x H600 (43.7" x 50" x 23.6")	W940 x D1015 x H500 (37.0" x 34.0" x 19.7")	W1157 x D1015 x H500 (45.55" x 34.0" x 19.7")
Weight	65kg (143lbs)	200kg (350lbs	110kg (243lbs)	120kg (265lbs)

Inline PowerSpector BTL GTAz, GDAz

Bottom & Top Simultaneous inspection

In-Line Series Specifications	PowerSpector GTAz + GDAz 350BTL	PowerSpector GTAz + GDAz 550BTL
Maximum PCB Size	350x250mm (13.8" x 9.8")	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 60mm (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	
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	W878 x D916 x H1313 (34.6" x 36.1" x 51.7")	W1078 x D1320 x H1317 (42.4" x 52" x 51.8")
Weight	240kg (397lbs)	400kg (529lbs)

PowerSpector

Inline PowerSpector BTL GTz + GTz

350, 520, 650, 800

In-Line Series Specifications	PowerSpector GTz + GTz 350BTL	PowerSpector GTz + GTz 550BTL
Maximum PCB Size	350x250mm (13.8" x 9.8")	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)	GTz 40mm (1.5") extendable to 60mm	
Side Cameras	NA	
Z-Axis movement range	30mm (1.2")	
Component clearance (bottom)	30mm (1.2")	
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	W878 x D916 x H1313 (34.6" x 36.1" x 51.7")	W1078 x D1320 x H1317 (42.4" x 52" x 51.8")
Weight	240kg (397lbs)	400kg (529lbs)

SpectorBOX GTz / GTAz

Bottom Up

In-Line Series Specifications	SpectorBOX GTz550	SpectorBOX GTAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Soldering, Bridges, Solder Balls, Components	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Image Parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm or 19.5x19.5mm/10µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Side Cameras	NA	8 side cameras CL/USB3 Vision with Tilt-Shift custom lenses in 45/45 degree configuration
Lighting system	Omnidirectional Quad LED rings: Side, Main, Line Sourced DOAL (Diffused On Axis Light (Coaxial)) Side Camera White	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	30-65mm (1.2-2.6"") factory preset	30mm (1.2")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming Interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 deg. C(60-90 deg. F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bottom to PCB surface, incl focus range)	347-427mm (13.7-16.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

SpectorBOX GWz/GWAz

Top Down

In-Line Series Specifications	SpectorBOX GWz550	SpectorBOX GWAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Presence/Absence, Type, Polarity, Colour, Text, Offset	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Image Parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm	
Lens	Focal & Aperature Adjustable Macro Lens	
Side Cameras	NA	8 side cameras CL/USB3 Vision in 45/45 degree configuration
Side cameras FoV/Resolution	NA	50x39mm/70µm(1.96x1.54")
Lighting system	Omnidirectional White Ring Light	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	130mm (5.1")	130mm (5.1")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming Interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 deg. C(60-90 deg. F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bottom to PCB surface, incl focus range)	469-549mm (18.5-21.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

SpectorBOX GDz/GDAz

Top Down

In-Line Series Specifications	SpectorBOX GWz550	SpectorBOX GWAz550
Maximum PCB Size	550x520mm (21.7" x 20.5")	
Characteristics		
Product type	Automatic Optical Inspector	
Camera movement	X+Y+Z Direction	
PCB movement	Stationary during inspection, Transport designed by system integrator	
Parts inspection	Soldering, Bridges, Solder Balls, Components	
Imaging principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Image Parameters	Brightness, Contrast, Hue, Saturation via Filters	
Specifications		
Main Camera type	Digital CL with Lightbridge Thunderbolt	
Main Camera FoV/Resolution	38.5x38.5mm/18.75µm	
Lens	Telecentric lens with built in prism for DOAL Lighting	
Side Cameras	NA	8 side cameras CL/USB3 Vision in 45/45 degree configuration
Side cameras FoV/Resolution	NA	50x39mm/70µm(1.96x1.54")
Lighting system	Omnidirectional Quad LED rings: Side, Main, Line Sourced DOAL (Diffused On Axis Light (Coaxial)) Side Camera White	
Minimum inspection object size	80µ (3.15 mils)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance	60mm (2.3")	50mm (2")
Z-Axis movement range	80mm (3.1")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min	
Interfacing		
Control PC type (not included)	Apple MacMini (or higher) with Mac OSX and Thunderbolt interface	
PC Control & Imaging interface	USB, USB3 Vision, Thunderbolt	
Programming Interface	CSV Centroid file (Placement file)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (option) (Windows 7/8/10 based)	
3rd party Interfacing (MES) & Data Storage	Enterprise SQL DB/XML Files/Socket (by optional Mek Catch System)	
External Control ; External Bar Code interfacing	Contact Closure General Purpose I/O ; RS232/USB/XML	
General		
Mains Voltage	100-240 Vac / 150W	
Operating temperature	15-30 deg. C(60-90 deg. F)	
Operating humidity	<80 % RH	
Min. Construction Height (Distance Module bottom to PCB surface, incl focus range)	469-549mm (18.5-21.6") @Z=0-80mm (0-3.1")	
External size	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")	
Weight	100kg (220lbs)	

Nutek Main Frame

Mainframe for SpectorBOX

In-Line Series Specifications	Size
Maximum PCB Size	(l x w) 550mm x 520mm (21.7" x 20.5")
Camera movement	(l x w) 50mm x 50mm (2"x2")
Maximum PCB Weight	15kg (30lbs)

Specifications (optionally customizeable	
Conveyor concept	Tooth Belt, Feed & Return conveyer configurable
Conveyer height	Configurable 280-980mm (11"-39")
Component clearance	Top/bottom 30-130mm (1.18"-5.12") Spectorbox model dependent
Belt speed	Adjustable
PCB edge support	3mm (0.12")
Conveyer width adjustment	Manual crank
Power supply	100-230VAC
Power consumption	Configuration dependendent <1kW

General	
Weight	Mainframe chassis 400kg (200 lbs) excl SpectorBOX
Overall Dimensions	(L x W x H) 1391x1300x1617mm (54.8" x 51.2" x 63.7")

iSpector JK

JK520V, JK350V

Desktop Series Specifications	iSpector JK 350V	iSpector JK 520V
Maximum PCB Size	350x250mm (13.8" x 9.8")	520x460mm (20.5" x 18")
Characteristics		
Product type	Automatic Optical Inspector	
In-line/Off-line	Off-Line	
Movement type	Camera X, Table Y	Camera X, Y
PCB movement	Moving table	Static table
PCB fixation	Support one side with plunger. North South Clamping	
Parts inspection	Presence, Polarity, Offset, Correctness, Soldering	
Distinction principle	Synthetic Imaging, Spectral Analysis, Greyscale limits	
Distinction parameters	Brightness, Hue, Saturation via Filters	
Camera type	UXGA CCD digital with USB 3 Vision	
Camera Field Of View/Resolution	36mm x 30mm (1.42"x1.18") 15µm	
Lens	High Resolution Macro Lens	
Lighting system	Triple LED Rings: Red, Green, Blue	
Specifications		
Minimum inspection component size	0201" (15 µm resolution)	
Positioning accuracy	Pixel related Feedback Loop	
Component clearance (top/bottom)	+30mm (1.18")/-60mm (-2.4")	
Movement speed	720mm/s	
Inspection capacity typical	2500cps/min 4.45 FOV/sec	
Mains	100-240 Vac / 150W	
Interfacing		
Control PC type (not included)	Apple Mac Mini or iMac	
PC Control & Imaging interface	USB / USB 3.0 Vision	
Programming Interface	CSV Centroid file (Placement Data)	
Repair/Monitor/SPC System/MES-interface	Mek Catch System (Windows 7/8/10) (option)	
3rd party Interfacing (MES-if) & Data Storage	Enterprise SQL DB/XML Files/Socket (Catch System Option)	
General		
Operating temperature	15-30 degr C	
Operating humidity	15-80 % RH	
External size	W760 x D860 x H450 mm (30.3" x 34.3" x 18"	W 1030 x D 1060 x 410 mm (W 40.5" x D 41.7" x 16.1")
Weight	45kg (99lbs)	95 kg (529 lbs)

iSpector JDz

JDz520

Desktop Series Specifications	iSpector JDz 520
Maximum PCB Size	520x460mm (20" x 18")
Characteristics	
Product type	Automatic Optical Inspector
In-line/Off-line	Off-Line
Movement type	Camera X, Y
PCB movement	Static table
PCB fixation	North South Clamping
Parts inspection	Presence, Polarity, Offset, OCV, Soldering
Distinction principle	Synthetic Imaging, Spectral Analysis, Greyscale limits
Distinction parameters	Brightness, Hue, Saturation via Filters
Camera type	4.8 MP CCD digital with USB 3 Vision
Camera Field Of View/Resolution	36.0 x 30 (1.42" x 1.18") 15μm
Lens	High Resolution Telecentric lens
Lighting system	Triple LED :White Main ,Red Side, DOAL White
Specifications	
Minimum inspection component size	0201" (15μm resolution)
Positioning accuracy	Pixel related Feedback Loop
Component clearance (top/bottom)	+40mm (1.6")/-70mm (-2.2") (optionally +60/-70 mm extended top clearance)
Movement speed	720mm/s
Inspection capacity typical	2500cps/min 4.45 FOV/sec
Mains	100-240 Vac / 150W
Interfacing	
Control PC type (not included)	Apple Mac Mini or iMac
Control / Imaging interface	USB / USB 3.0 Vision
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-if) & Data Storage	Enterprise SQL DB/XML Files/Socket (Catch System Option)
General	
Operating temperature	15-30 degr C
Operating humidity	15-80 % RH
External size	W 1030 x D 1060 x H 410. mm (W 40.5" x D 41.7" x H 16.1")
Weight	95 kg (209 lbs)

ISO-Spector S2 SPI

S2 5D Solder Paste Inspection System

Specifications	PowerSpector S2 SPI
Model	S2
Maximum PCB Size	510 mm x 460 mm 20.1 inch x 18.1 inch

Characteristics	
Inspection Items	Volume, Height, Area (section/projection/average), Offset, Shape, Bridging and more
Minimum PCB Thickness	0.3mm (11.8 mils)
Maximum PCB Thickness	s 4.0mm (157.5 mils)
Minimum Component Size	01005 chip 18/9 micron lens 008005 with optional 12/6 micron lens
Minimum Pad size	200µm (4 mils) diameter in normal mode (18 Micron lens) 150 micron (12 micron lens)
Maximum Paste Height	600µm (23.6 mils
Maximum PCB Warp	±6mm (240 mils)
Inspection Speed	18/9 micron lens 18micron: 9300 mm2/sec Standard speed, 18500 mm2/sec High speed 9 micron: 4100 mm2/sec High Resolution 12/6 micron lens 12micron: 3300 mm2/sec Standard speed, 6500 mm2/sec High speed 6 micron: 1600 mm2/sec High Resolution

Optics	
Camera	Patented advanced 5D sensor
Lens Type	High Grade Telecentric
2D Illumination	RGB Vertical illumination and RGB Low angle Illumination
3D Illumination	Blue/Violet Laser with sub pixel processing

Conveyor System	
Width Adjustment	Automatic
Conveyor Height	830 ~ 970 ± 25mm (1")
Conveyor Configuration	Left to right and right to left with front side fixed or rear fixed
Minimum PCB Size	50 x 50mm (1.97" x 1.97")

Interfacing	
Communication Interface	Extended SMEMA
Controller	Intel™ based PC (included)
Operating System	Windows™ 8 Pro 64Bit

General	
Power Supply	200 ~ 240V, 50/60Hz, 1.5KVA
Air Supply	0.4 ~ 0.5Mpa, 10Nl per minute
Operation Environment	10 ~ 60 °C
Operating Humidity	35-85% RH
External size	W1100 x D1200x H2080 (43.3" x 53.38" X 78.22")
Weight	Approx. 400Kg

iSpector JUz (Conformal Coating)

JUz 350L, JUz 520, SpectorBOX JUz 550

Desktop Series Specifications	iSpector JUz 350L	iSpector JUz 520	SpectorBox JUz 550
Maximum PCB Size	350x250mm (13.77" x 9.84")	520x460 (20.4" x 18.1)	550x500 (21.7" x 19.7)
Characteristics			
Product type	Automatic Optical Conformal Coating Inspector		
In-line/Off-line	In-Line	Desktop	Modular
PCB Movement	Static Conveyor	Static Table	Integration
PCB Fixation	North South Clamping, PCB Edge Lift	North, South Clamping	Integration
Parts inspection	Presence, Polarity, Offset, OCV, Conformal Coating, Presence, Absence, Splashes, Bubbles, Coverage		
Distinction Principle	Synthetic Imaging, Spectral Analysis, Greyscale Limits		
Distinction Parameters	Synthetic Imaging, Spectral Analysis, Greyscale limits		
Image Parameters	Brightness, Hue, Saturation via Filters		
Camera type	5MP CCD digital with USB 3 Vision		
Camera Field Of View/ Resolution	47 x 39 mm (1.8" x 1.53") 19µm		
Lens	High Resolution Lens		
Lighting system	Dual LED :White Main , 365 nm UV LED		
Specifications			
Minimum inspection component size	0401" (19µm resolution)		
Positioning accuracy	Pixel related Feedback Loop		
Component Clearance (Top/ Bottom)	+60mm (1.6")/-60mm (-2.2")		
Movement Speed	720mm/s		
Inspection capacity typical	2500cps/min 4.45 FOV/sec		
Mains	100-240 Vac / 150W		
Interfacing			
Control PC type (not included)	Apple Mac Mini or iMac		
Control / Imaging Interface	USB / USB 3.0 Vision		
Programming Interface	CSV Centroid File (Placement Data)		
Repair/Monitor/SPC System/MES-interface	Mek Catch System (Windows 7/8/10) (option)		
3rd party Interfacing (MES-if) & 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	W 698 x D 600 x H 1298 mm (W 27.5" x D 23.6" x H 51.1")	W 1030 x D 1060 x 410 mm (W 40.5" x D 41.7" x 16.1")	W900 x D1080 x H316 (35.5" x 42.5" x 12.4")
Weight	210 kg (463 lbs)	95 kg (529 lbs	80kg (220lbs)

because inspection matters

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