

# AXION



## Key Features

- Extremely fast laser scan 2D & 3D AOI
- Highly focused 2 channel laser for 3D data generation
- 3D laser can inspect highly specular surfaces (Bare die, IPD, Die Attach, and Underfill fillet)
- High bandwidth on a broad range of colors, surface roughness, and materials
- Virtually zero escape & false call rates
- Built-in magazine Loader/Unloader

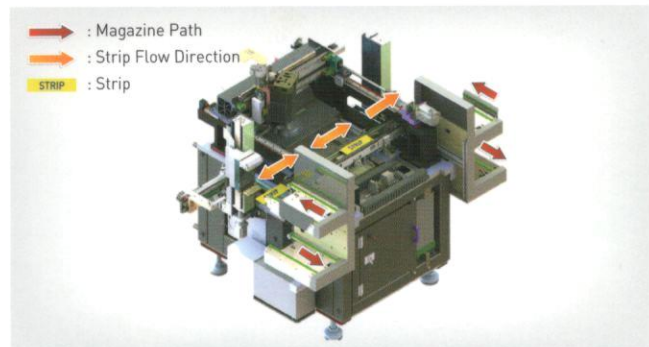
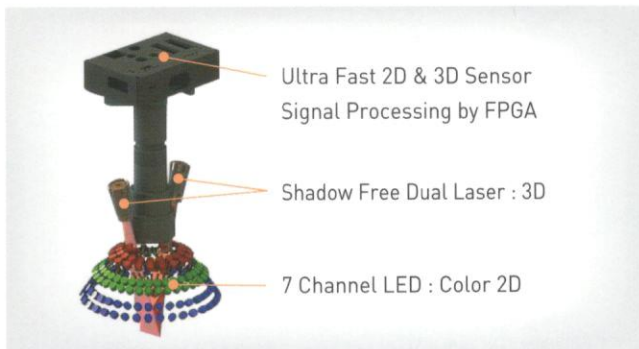
## Super Precision Laser Scan 3D AOI with Integrated Loader/Unloader

'Axion' is a precise and high speed 2D & 3D AOI machine. It is optimized for inspections required in PCB, lead-frame, FC, and SiP assembly process such as die attach, cu clip attach, underfill, solder paste and ball attach. 'Axion' delivers precise 2D inspection capability and at the same time it performs high speed 3D inspections (Height, Tilt, Lift, and Volume) with its highly focused laser beam. Additionally, 'Axion' is the only machine capable of inspecting foreign material/contamination and warpage on the die surface, metal lead frame, and PCB substrates simultaneously.

Our patented 2D & 3D vision optics unit (TRSC) creates 2D color images by using a 3 channel RGB LED illumination system and 3D data with 2 channel laser sheet beam. The entire inspection is completed with only a single scan. PARMi's exclusive laser scan technology can accurately inspect highly specular components and materials such as bare die, IPD, and underfill fillet while other conventional AOI system reflect light away making inspection difficult. Since 3D data is created at a speed more than several hundreds times faster than the laser pointer method, it is possible to perform 100% inspection and eliminate random sample inspection.

The required time to make a single teaching program with the user friendly designed UI (User Interface) and advanced intelligent algorithm is typically less than 30 minutes. Moreover, various software tools such as e-Map, SPC (Statistical Process Control), operator 2<sup>nd</sup> verification, remote control and monitoring, and offline software are available.

The integrated Loader/Unloader can handle all types of magazines available in the market, so up to 3 magazines with 100mm width or 5 magazines with 60mm width can be loaded at the same time. Magazine replacement does not require any tool changes and all work is done with software settings.



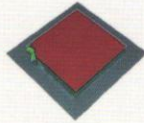
# PARMI

## Die Attach

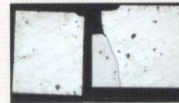
- BLT (Bond Line Thickness)
- Die Tilt, Misalignment, Chipping, Crack



Die Tilt



Die Chipping



Die Crack

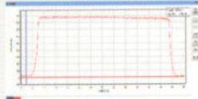


$$BLT = \text{Die Height}(H) - \text{Die Thickness}(D)$$

- Epoxy Coverage, Fillet Height and Runout measurement
- FM/Contamination, RBO (Resin Bleed Out)

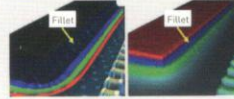
## Underfill

- Die and Package Tilt, Misalignment, Chipping, Crack

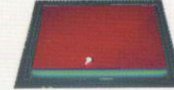


Cross section of Package & Underfill

- UF Coverage, Fillet Height and Runout measurement
- FM/Contamination, RBO (Resin Bleed Out)



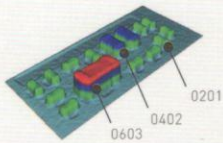
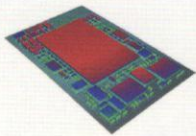
Fillet Height



Foreign material

## SiP (System in Package)

- Specular Die, IPD, Tiny Chip (0201~ : metric)
- Tilt, Dimension, Misalignment, Soldering, Bridge, Crack, FM/Contamination on substrate



## Specifications

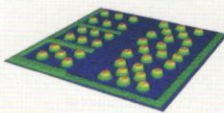
| Model                             | Axion                                        |            |
|-----------------------------------|----------------------------------------------|------------|
| Vision Module                     | TRSC-1 × 2                                   | TRSC-1 × 1 |
| Measuring Principle               | Shadow Free Dual Laser Optical Triangulation |            |
| Camera                            | 4M Image Sensor / Telecentric Lens           |            |
| Illumination                      | R.G.B LED 3 Stage Lightings                  |            |
| Scan Speed (sq.cm/sec)            | 3.75                                         | 15         |
| X-Y Resolution (μm)               | 3.5 × 3.5                                    | 7 × 7      |
| Max. Component Height (mm)        | 5                                            | 15         |
| Performance                       |                                              |            |
| Height Repeatability              | 3 sigma < 3μm                                |            |
| Height Accuracy                   | 2μm                                          |            |
| Magazine Handling                 |                                              |            |
| Width (mm)                        | 55 ~ 120                                     |            |
| Length (mm)                       | 160 ~ 305                                    |            |
| Height (mm)                       | 60 ~ 200                                     |            |
| Max. Magazine Stack Q'ty          | 3 Magazines (based on Magazine Width 100mm)  |            |
| Strip Handling                    |                                              |            |
| Width (mm)                        | 50 ~ 115                                     |            |
| Length (mm)                       | 155 ~ 300                                    |            |
| Thickness (mm)                    | 0.08 ~ 1                                     |            |
| Max. Weight (kg)                  | 0.5                                          |            |
| Top/Bottom Edge Clearance (mm)    | 3.3 / 3.3                                    |            |
| Top/Bottom Clearance (mm)         | 3 / Backup Plate                             |            |
| System Dimension                  |                                              |            |
| W×D×H (mm)                        | 1,770 × 1,419 × 1,576                        |            |
| Weight (kg)                       | 1,100                                        |            |
| Conveyor Height (mm)              | 880 ~ 970                                    |            |
| Conveyor Speed Range (mm/sec)     | 200 ~ 400                                    |            |
| Strip Flow Direction              | Loader to Unloader (Factory Setting)         |            |
| Conveyor Width Adjusting          | Auto                                         |            |
| Computer & Console                |                                              |            |
| CPU                               | i7-7800X or above                            |            |
| Operating System                  | Windows 7 or above                           |            |
| Display                           | 24" Monitor                                  |            |
| Software                          |                                              |            |
| Inspection Program                | AOIworks                                     |            |
| Teaching Program                  | ePM (Gerber, BOM, Cad)                       |            |
| SPC&Process Monitoring            | SPCworksAOI, xNetHub                         |            |
| Verification Program              | Veriworks                                    |            |
| System Diagnosis                  | AOIManager, AOIDBManager                     |            |
| Barcode(1D/2D) Recognition        | Built in AOIworks                            |            |
| (Option) Offline Teaching Program | AOIworks Offline                             |            |

\* Specifications in this catalog are subjected to change without notice for quality improvement.

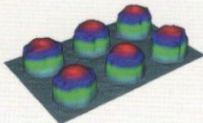
Rev.1

## Solder paste and Bump

- Height, Area, Volume, Misalignment, Bridge, Coplanarity
- Substrate Warpage, FM/Contamination



Solder paste



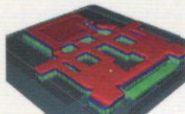
Solder ball

## Cu Clip on die

- Die Misalignment, Tilt, BLT, Fillet Coverage and Height
- Cu Clip Height, Tilt, Warpage, Misalignment, Fillet Coverage and Height



Solder Fillet Joint



Misalignment

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