TECHNOLOGICALLY ADVANCED

MS-11 Series

- High Speed Precision In-Line SPI System
- FOUR MEGA PIXEL Digital Camera Technology
- Precision TELECENTRIC Compound Lens Design
- 10 Micron / Pixel Resolution
- 2 Micron Height Accuracy
- Volume Repeatability +/- 2%
- Extremely Simple Programming and Operation

MOIRE 3D Phase Step Image Processing
Advanced Dual Probe SHADOW FREE Design
Superior Solder Profile Characterization
Absolute Repeatability and Reproducibility

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## MS-11 Series Features and Specifications

### Standard Features:
- Pentium™ IV PC, 19” Flat Screen LCD Monitor, Windows XP™ OS, HDD, Mouse & Keyboard, Network LAN Card.
- Three (3) Stage High Speed Conveyor System with Programmable Width Control and Automatic PCB Support.
- Automatic Gerber Import Software.

### Options:
- Four Mega Pixel CCD Camera System (See Specifications).
- 2D Bar Code Reader - Gun Type - 2D Bar Code Reading Capability Using Handheld Gun Type Reader.
- 2D Bar Code Reader - Camera Type - 2D Bar Code Reading Capability Using the Top Down Camera System.
- Off-Line Gerber Import Software.
- Remote SPC Software.
- In-Line Repair System.
- Watcher Process Control Software.

### System Specifications:

#### Camera Options

<table>
<thead>
<tr>
<th>Camera Options</th>
<th>Field Of View</th>
<th>Resolution</th>
<th>Inspection Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2M Pixel Camera</td>
<td>32.0mm x 24.0mm (1.26”x0.94”)</td>
<td>2 Mega Pixels @ 20 um/pixel</td>
<td>20 cm²/sec</td>
</tr>
<tr>
<td>4M Pixel Camera Option 1</td>
<td>47.0mm x 36.4mm (1.85”x1.43”)</td>
<td>4 Mega Pixels @ 20 um/pixel</td>
<td>41 cm²/sec</td>
</tr>
<tr>
<td>4M Pixel Camera Option 2</td>
<td>35.3mm x 25.9mm (1.39”x1.02”)</td>
<td>4 Mega Pixels @ 15 um/pixel</td>
<td>23 cm²/sec</td>
</tr>
<tr>
<td>4M Pixel Camera Option 3</td>
<td>23.5mm x 17.3mm (0.92”x0.68”)</td>
<td>4 Mega Pixels @ 10 um/pixel</td>
<td>9 cm²/sec</td>
</tr>
</tbody>
</table>

#### Camera Lens Design
- Precision Telecentric Compound Lens

#### Inspection Methodology
- Shadow Free - Moiré 3D Phase Step Image Processing

#### Height Resolution
- 0.1 um

#### Height Accuracy
- Calibration Jig: 2 um

#### Height Repeatability
- Calibration Jig: +/- 1%

#### Volume Repeatability
- Calibration Jig: +/- 2%

#### Maximum Inspection Height
- 450 um

#### Minimum Inspection Height
- 40 um

#### Maximum PCB Warpage
- +/- 5mm

#### Measurement Capability
- Volume, Area, Height, X-Y Position

#### Defect Detection
- Insufficient/Excessive Solder, Bridging, Shape Deformity and Paste Offset

#### Positioning System
- Closed Loop AC Servo Drive System

#### Repeatability
- +/- 15 um (± 0.000591 in.)

#### Power Requirements
- Single Phase 208 VAC ± 10%; 50/60 Hertz; 5 Amps

#### Air Requirements
- 0.5Kgf / cm² (7 PSI)

#### Model Number and PCB Size Range

<table>
<thead>
<tr>
<th>Model Number</th>
<th>PCB Size Range</th>
</tr>
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<tbody>
<tr>
<td>MS-11</td>
<td>50mm x 50mm to 510mm x 460mm (2.0” x 2.0” to 20.1” x 18.1”)</td>
</tr>
<tr>
<td>MS-11U</td>
<td>60mm x 60mm to 660mm x 510mm (2.36” x 2.36” to 25.9” x 20.1”)</td>
</tr>
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</table>

#### Model Number and Machine Dimensions

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<th>Machine Dimensions</th>
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<tbody>
<tr>
<td>MS-11</td>
<td>1,725mm W x 1,280mm D x 2,052mm H (67.9” W x 50.4” D x 80.8” H)</td>
</tr>
<tr>
<td>MS-11U</td>
<td>1,992mm W x 1,310mm D x 2,052mm H (78.4” W x 51.6” D x 80.8” H)</td>
</tr>
</tbody>
</table>

#### Model Number and Weight

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>MS-11</td>
<td>800kg (1,764 lbs)</td>
</tr>
<tr>
<td>MS-11U</td>
<td>1,000kg (2,205 lbs)</td>
</tr>
</tbody>
</table>