Orbotech Ultra Dimension™ 700

Automated Optical Inspection (AOI)

Orbotech Ultra Dimension 4-in-1 AOI Solution

Orbotech Ultra Dimension series is revolutionizing the AOI room workflow for advanced PCB production, including SLP, mSAP, advanced HDI, advanced flex and IC substrates. Built to meet the market's constantly evolving requirements for quality and reliability, Orbotech Ultra Dimension is the first AOI solution to integrate best-in-class pattern inspection, laser via (LV) inspection, remote multi-image verification pro (RMIV Pro), and 2D metrology in a single groundbreaking system.

Benefits

Unique Inspection Capabilities

- First solution to perform both pattern and laser via inspection in a single scan enabled by KLA's Triple Vision™ technology

- Significant reduction in false alarms without having to use inspection masks enabled by Magic™ technology

- Dedicated inspection channels for all stages of laser via production

Image 1

Image Processing 1

Over Drill   Dishdown

Shallow-Short

Microscope image

Image 2

Image Processing 2

Image 3

Image Processing 3

### Remote Multi-Image Verification Pro (RMIV Pro) - New Approach to Verification

- Automated simultaneous "grabbing" of defect multi-images

- Significantly shorter verification cycle time than existing solutions

- Major reduction in quantity of standard verification stations and operators

Integrated, Automated 2D Metrology

- Unique capability to measure at both top and bottom conductor widths, ensuring higher reliability and tight impedance control

- Significantly faster 2D measurement cycle time

- Traceability and data analysis enabled by digitalized process

Lower Total Cost of Ownership (TCO)

- More than 30% reduction in overall TCO

- Significantly lower labor costs

- Far less floor space required
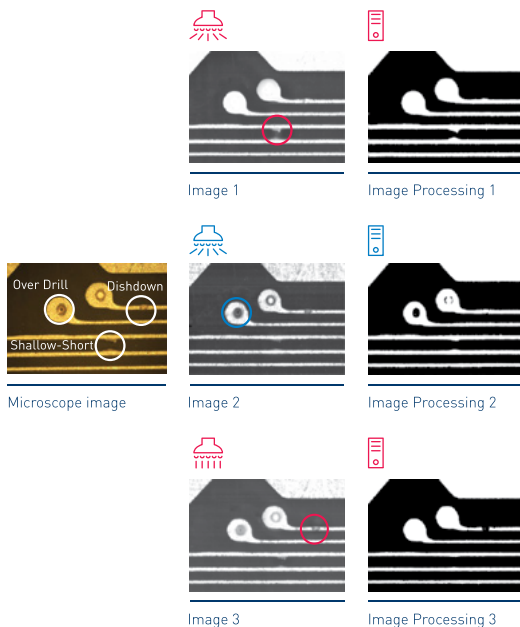
4 Best-in-Class AOI Solutions in a Single System

Orbotech Ultra Dimension combines four best-in-class solutions in a single system, delivering new capabilities that further improve quality, yield and cost-efficiency. Combined together, these solutions signify a revolution in the AOI room workflow, representing a new era in AOI efficiency.

Unique Inspection Capabilities

Orbotech Ultra Dimension is the first AOI solution to perform both pattern and laser via inspection in a single scan. Powered by KLA's Triple Vision and Magic technologies, it delivers superior pattern inspection results across the board, from improving detection, through reducing false alarms, to decreasing setup time. Orbotech Ultra Dimension provides manufacturers of advanced PCB processes with the flexibility to inspect a variety of applications and materials without any compromise.

Triple Vision technology enables simultaneous inspection and analysis of three different types of images using varied light settings and thresholds as required. This leads to highly accurate detection and classification of a wide variety of defect types, including fine shorts, dish downs, laser via shifts, laser via under/overdrilling and more.

Driven by state-of-the-art algorithms, KLA's Magic technology removes the need to use inspection masks that can cause defects to be missed.

Remote Multi-Image Verification Pro (RMIV Pro) - New Approach to Verification

Orbotech Ultra Dimension enables the remote verification of multiple images that are automatically and simultaneously grabbed during the inspection process. By integrating images from three channels into a single multi-color image, the solution enables operators to accurately differentiate between real and false defects in far less time than the current industry standard. This leads to a significantly faster verification cycle time as well as a reduction in the number of required verification stations and the labor and floor space needed.

Integrated, Automated 2D Metrology

KLA's 2D metrology enables automatic measurement of both top and bottom conductor widths. This addresses the market's increasing demand for the higher accuracy and impedance control necessary for SLP/mSAP, advanced HDI, HLC and automotive applications. This process, which is fully automated, ensures fast, accurate and repeatable measurement. Complete digitalization of the process means that it also fully supports traceability and data analysis. KLA's 2D metrology is renowned for its exceptionally fast and accurate solution, achieving results in seconds.
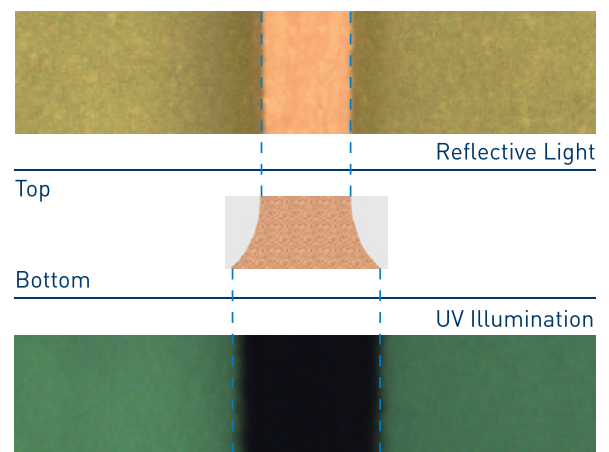
Lower Total Cost of Ownership (TCO)

By combining 4 best-in-class solutions into a single system, Orbotech Ultra Dimension is the most efficient solution available today for the AOI room. This new system dramatically reduces the number of machines required, freeing up valuable floor space in the AOI room. By cutting the number of verification stations needed, Orbotech Ultra Dimension also enables manufacturers to significantly lower their labor costs as well as their overall TCO.

Technologies   Magic™ Technology   Triple Vision™ Technology

KLA⁺

Specifications

Technology Range	Down to 0.6mil (15µm) line/space
Inspected Products	**Inner layers:** Signal, power and ground, mixed, cross shielding, inner with holes, buildup **Outer layers:** Signal, mixed, cross shielding, buildup **Build-up layers:** Laser vias at various production stages
Inspected Materials	**Conventional:** Bare copper (shiny, matte), etched additive or plated copper, reverse treated foil (RTF), double-treated copper, goldplated conductors. Any laminate including FR4, Tetra function, Teflon, Roger, etc. **Flex material:** Polyimide, polyester **Advanced build-up board materials:** RCC, ABF, BT, ALIVH **Photoresist:** Blue, purple and brown
Detected Defects	Shorts, opens, minimum line/space violations, nicks, protrusions, dish downs, copper splashes, pinholes, missing or excess features, wrong size and position of features, clearance and split plane violations, blocked holes, annular ring violations, SMT violations, black spots, wire bonding pad defects, flip chip pad defects, laser via defects as missing drill, over drill, under drill, via shift, residue in the via, via size & shape
Inspection Methods	Full reference comparison **Triple Vision technology** – simultaneous inspection and analysis of three different types of images for pattern & LV inspection ensuring highest detection rate **Magic technology** – state-of-the-art algorithms to smartly reduce false-alarm rate without any masks - Model-based, contour comparison and specific criteria per feature - Full multi-layer panel understanding (SIP based)
Panel Dimensions	**Maximum panel size/inspected area:** 24" x 30" (610mm x 762mm) **Thickness range:** 1-300mil (25-7500µm)
Defect Verification	RMIV Pro ready **Verification and repair stations:** Orbotech VeriSmart™, Orbotech VeriWide™, Orbotech VeriFine™, Orbotech VeriSmart™-A, Orbotech VeriWide™-A, Orbotech VeriFine™-A, Orbotech Ultra VeriFine-A **On-system verification:** built-in HD video camera
Metrology	2D metrology-ready
Automatic Defect Shaping	Orbotech Precise™ 800, Orbotech Ultra PerFix™ 120N, Orbotech PerFix™ R2R
Setup Data Sources	CAM
Panel Registration Method	Pinless registration – panel edge alignment
Options	RMIV Pro seat 2D metrology solution Marker and stamper 2D barcode reader	R2R kit Automation Kit Large table: 27" x 30", 36.5" x 30"*
Dimensions (W x D x H)	161cm x 178cm x 186cm
Weight	900Kg

*This table size option is not field upgradeable

Specifications are subject to change without notice.
Orbotech Ultra Dimension™ 700 system is a class-1 laser product