X2000DF *series*

LASER DIRECT IMAGING FOR
PCB INNER- AND OUTER LAYER PATTERNING

WWW.LIMATA.COM

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The LIMATA **X2000 Series** is a laser direct imaging system platform designed for the patterning of PCB inner and outer layers.

The **X2000 platform is standardly equipped with a double drawer system including parallel registration**. With this feature, the PCB patterning process can be reduced from four process steps (including loading, registration, imaging, unloading) down to only one step (imaging). A fully automated **X2000 twin-set option provides further capacity for high-volume PCB production**.

Best in class registration of the panel is guaranteed by using a multi-point sub-registration method without any loss in capacity and non-linear scaling. Up to 4 HD cameras with RGB light can detect the reference marks without influencing production throughput.

The **X2000 system** combines different laser diode wavelengths in parallel working and precise laser spots. The use of cost-efficient high energy UV diode-lasers with lifetimes of over 25,000h support lower total costs of ownership.

Finest lines and spaces are achieved by using a **variable beam shaping optic (HD/HR-option)**, which provides for an automatic laser spot size alignment during the imaging of standard PCB and HDI applications.

Full PCB **product traceability** and data exchanges via **MES & Secs/Gem** interfaces can be provided.

Availability of complementary **automation options** for fully automated single or dual LDI-system operation

Features and Benefits

- **New flexible laser direct imaging platform** for the production (patterning) of standard, advanced and custom PCB applications

- **High volume production capability** with an automated in-line LDI system set-up

- **Double drawer system** significantly improves cycle time and throughput (panels/h)

- **Unique modular multi-wave laser set-up** with +25.000 hours' lifetime. The optimum laser capacity set-up can be selected and configured according to customer needs

- **Highest optical depth of focus** (+/-500μm) guarantees constant resolution without limitation

- **Optimized machine footprint** for PCB manufacturing lines with space restrictions

- **Ease-of-use** operator friendly handling and data interface

Applications

· **Standard PCB and HDI production**
  Consumer electronics, automotive, industrial, military, aerospace, medical

· **Custom PCB production**
  Thick copper

REM examples
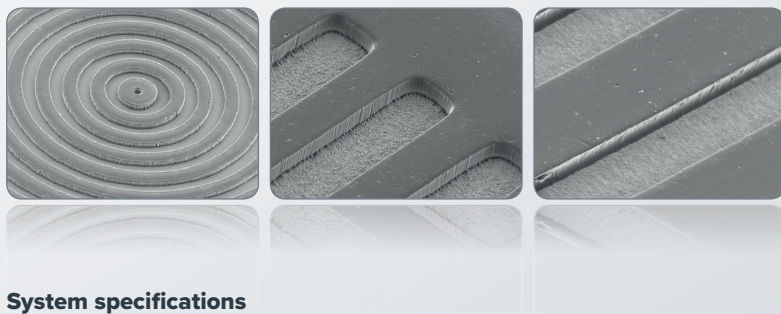
System specifications

Market:	Medium to high-volume PCB production
Operating table:	Dual table
Vacuum table:	Included
Mechanical system:	XY linear drive gantry system
Base:	Full granite
Weight:	ca. 4.500 kg
Dimensions:	1,5m x 3,2m x 1,95m / 59" x 126" x 76"
Footprint:	4,8 m^2
Communication interface:	Ethernet
Power supply:	400 VAC / 3+1 Phase
Upgradeable:	Up to 4 heads
Max. image size:	710 x 610 mm2 / 28" x 24"
Max. panel thickness:	25μm - 15 mm / 1mil - 0.6"

Imaging Features

UV Light engine:	Diode lasers
UV Laser wavelength:	400-410 nm
UV & IR Lifetime laser [typ.:]	> 25.000 h
UV Lasers per head:	4 - 6
Number of heads (exposure units):	1 - 4 heads
Depth of focus:	+/- 500μm / 20mil

Resolution Accuracy**

Min. dams:	50 μm / 2 mil
Min. Space:	50 μm / 2 mil
Min. Lines (HD-Option):	25 μm / 1 mil
Min. Space (HD-Option):	25 μm / 1 mil
Max. edge roughness:	+/- 10% min. res.
Max line width tolerance:	+/- 10% min. res.

Registration Features

Resolution Accuracy**	
Reg. System:	Up to 4 x HD Cameras
Camera Lighting:	RGB
Top to bottom layout [typ.]:	up to +/- 10 μm / 0.4 mil

For more information
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* depending on fiducial and layout quality
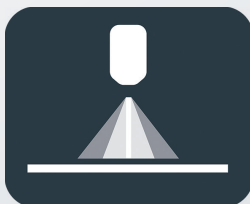
** depending on resist material

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System options

HD-Option

- Adjustable laser spot size for advanced HDI production
- Processing of lines / spaces down to 1 mil /25 um

Multi-Point Registration

- Detection of multiple fiducials for max. registration quality
- No cycle time loss from registration due to parallel working HD camera systems and double drawer handling approach
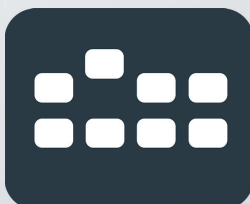
Traceability & MES - Interfaces

- Automated tracking of individual QR- and Barcodes or serial numbers as well MES-interface programming options for full product traceability
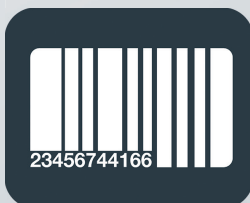
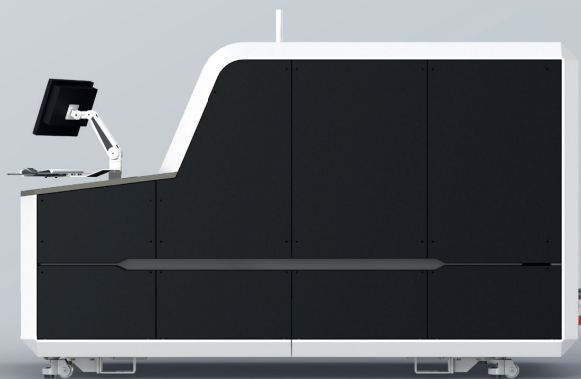### Pin-Less UV-marking System

- Detection of inner layers without any holes
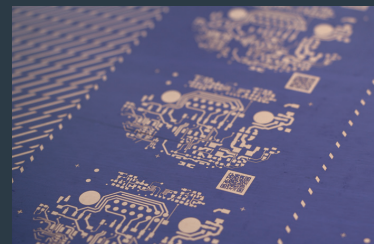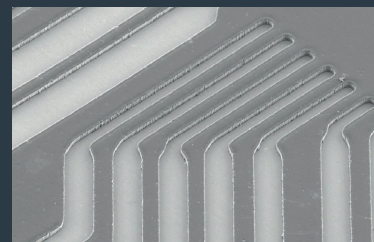
Automation

- The X2000 platform can be complemented by a robotic set-up for a fully automated and less labor intensive LDI in-line operation production demands

X2000DF modular system configurations

LDI System family	X2200-DF	X2300-DF	X2400-DF
UV laser heads	2	3	4
UV diode lasers per head	4/6	4/6	4/6
Total UV lasers	8/12	12/18	16/24

Modularity