DIRECT IMAGERS
MASK WRITERS

2022

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FLATBED IMAGING SYSTEMS

Productronica 2021

A MESSAGE FROM ROBIN PAGAN
Chief Executive Officer,
MIVA Technologies GmbH

INTRODUCTION AND MISSION:
MIVA Technologies GmbH is a German company dedicated to development, production and customer servicing of flatbed imaging systems. A wide range of imager sizes (7.5cm to 6m) and resolutions (50μm to 1,5μm) coupled with closed-loop high positional accuracy, low investment and service costs have been realised to-date. MIVA systems have been servicing worldwide markets for more than thirty years. It is our aim through technical innovation to optimise exposure speed, accuracy, resolution and reliability affordably, to establish a lasting and constructive relationship with our customers by offering fast, cost-effective production and service solutions, and by upgrading software and hardware if required.

VISION:
To invent, build and service imaging machines and production tools of the highest quality and reliability for our customers and to develop good, synergetic and lasting partnerships with all of them.

MIVA Technologies
3000L Direct Imager Series

MIVA CORE EXPERTISE

Over 30 years OEM of innovative precision imaging machines

Over 100 DI systems in operation

MIVA TECHNOLOGIES

Managing Director:
Robin Pagan

Manufacturing and Product Development
Stuttgart, Germany

MIVA
INSTALL LOCATIONS & COMPANY HISTORY

MIVA history 1985-2000

Product Development - A brief outline of MIVA imaging solutions over the last 35 years.

1980s

First MIVA raster photo-plotters replace slow, bulky and costly vector plotters.

Light modulator is a rectangular calibrated CRT, increasing plot speeds by a factor of up to x1000. Price of photoplotter is also reduced by up to 75%.

1990s

2nd generation MIVA raster Photoplotters.

Light modulator is LCD matrix, light source is a wide spectrum Xenon flashlamp.

2000s

First MIVA top down photoplotters, granite base with automation. First chrome imagers, resolutions up to 64.000dpi.

Light modulators increase resolution and quality, parallel to projection TV market synergising with MIVA plotter quality.

MIVA history 2000-2020

Product Development - A brief outline of MIVA imaging solutions over the last 35 years.

2005s

R+D Direct Imaging using MIVA raster technology. First DI prototype built.

Light modulator first generation Texas Instruments DMDs. Various light sources tested.

2010s

First DI installation in Germany.

Light modulator is UV capable DMD matrix, light source is a pulsed semiconductor LED.

2020

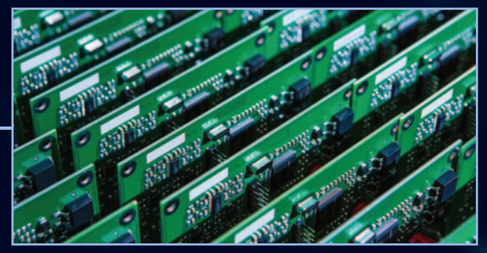
Over 100 MIVA L DI installations worldwide including DI, MW and custom builds, including 6m installation in south Germany, DART Optimization Suite for yield improvement, chip placement scaling.

Quad wavelength pulsed LED light sources, high resolution Mask Writers, multi-head Direct Imagers, Solder Mask dedicated Direct Imagers, R2R-Ready systems, 3D imaging technology

MIVA APPLICATION FIELDS

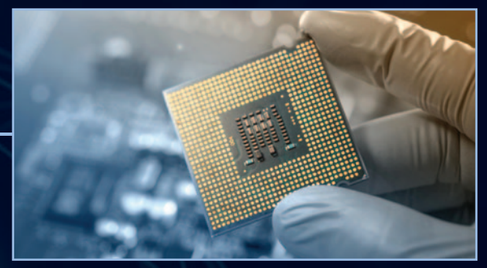
Printed Circuit Fabrication

- Over 100 systems installed worldwide
- Multi-LE, 1/2 mil l/s capable
- Inner, outer, soldermask, film
- Substrates up to 12mm thick



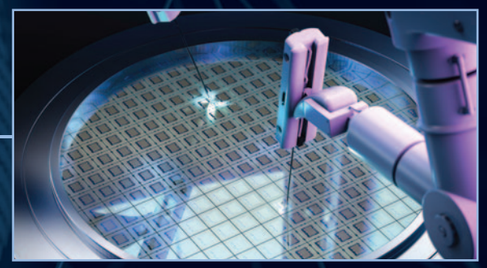
MicroElectronics / Electroforming

- Microelectronics and electroforming of features down to 3 micron
- OLED Display technologies for VHD display including virtual reality
- Microparts for watch movements



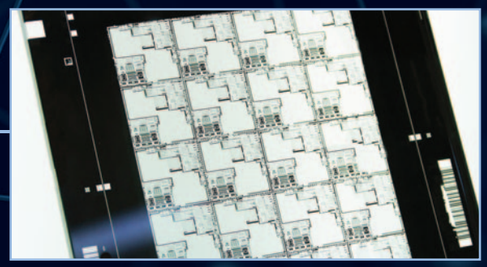
Substrate Imaging

- 16 layer additive imaging of microelectronics substrates to 2µ
- UCLA CHiPS consortium platinum member
- Ultra flat wafer vacuum chucks



Chrome Mask:

- 1,5μm direct write glass masters
- Large scale chrome masks
- Fluidics



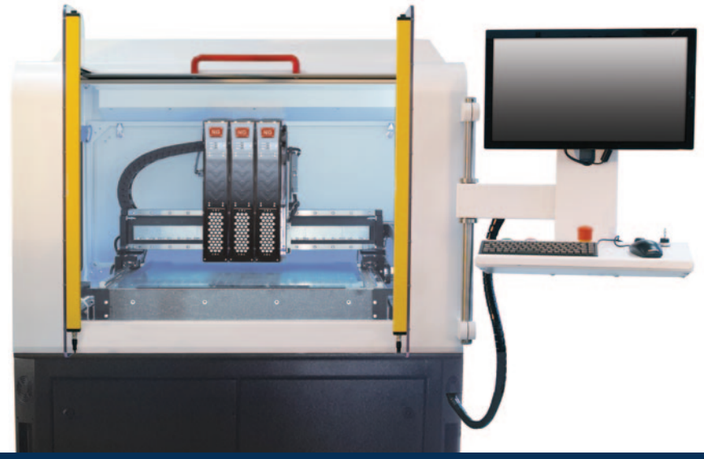
Emulsion Glass:

- 10 micron direct write glass emulsion
- XL calibration masters
- LS Lead-frame masters

MIVA
TECHNOLOGIES

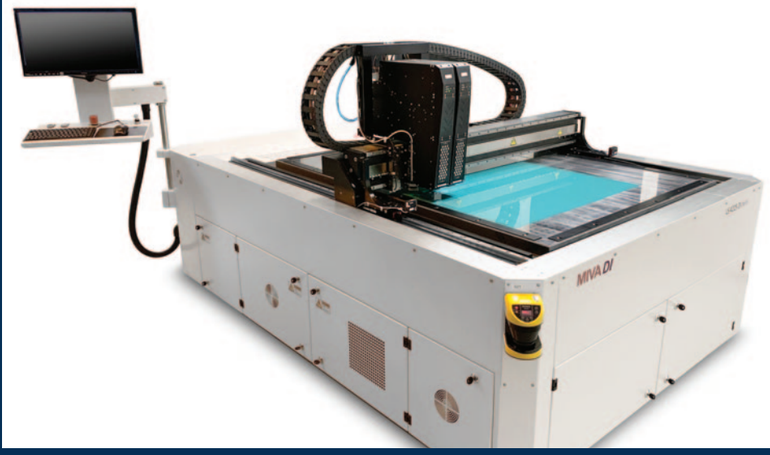
MIVA DIRECT IMAGING SYSTEMS

2200L DI Next Generation Direct Imager



- Standard PCB platform
- Quad-wave: images all standard resists, solder masks, films
- Quad-wave tuning: for imaging efficiency and sidewall steepness
- 30µ, 15µ, 6µ structures
- Toolless A/B registration
- Full Area High Resolution Scaling
- DART Compatible
- Small footprint, low power consumption
- Manual Loading, Automation Ready

3000L DI Next Generation Direct Imager



- Custom Large Format
- Panel Sizes
  30 x 60" (760 x 1524mm)
  42 x 60" (1067 x 1524mm)
- 30, 15µ features
- Toolless A/B registration
- Full Area High Resolution Scaling
- Flexible open design
- DART compatible
- Automation Ready
- Stepping for Infinite Length PCBs

1200MW Next Generation Mask Writer

- 305 x 407mm Imaging Area
- 6µ, 3µ, 1.5µ structures
- Additive Imaging sub 2µ
- DART compatible
- LED or Laser Light Engine Selectable
- Dual Resolution Selectable
- Chip on foil local scaling option

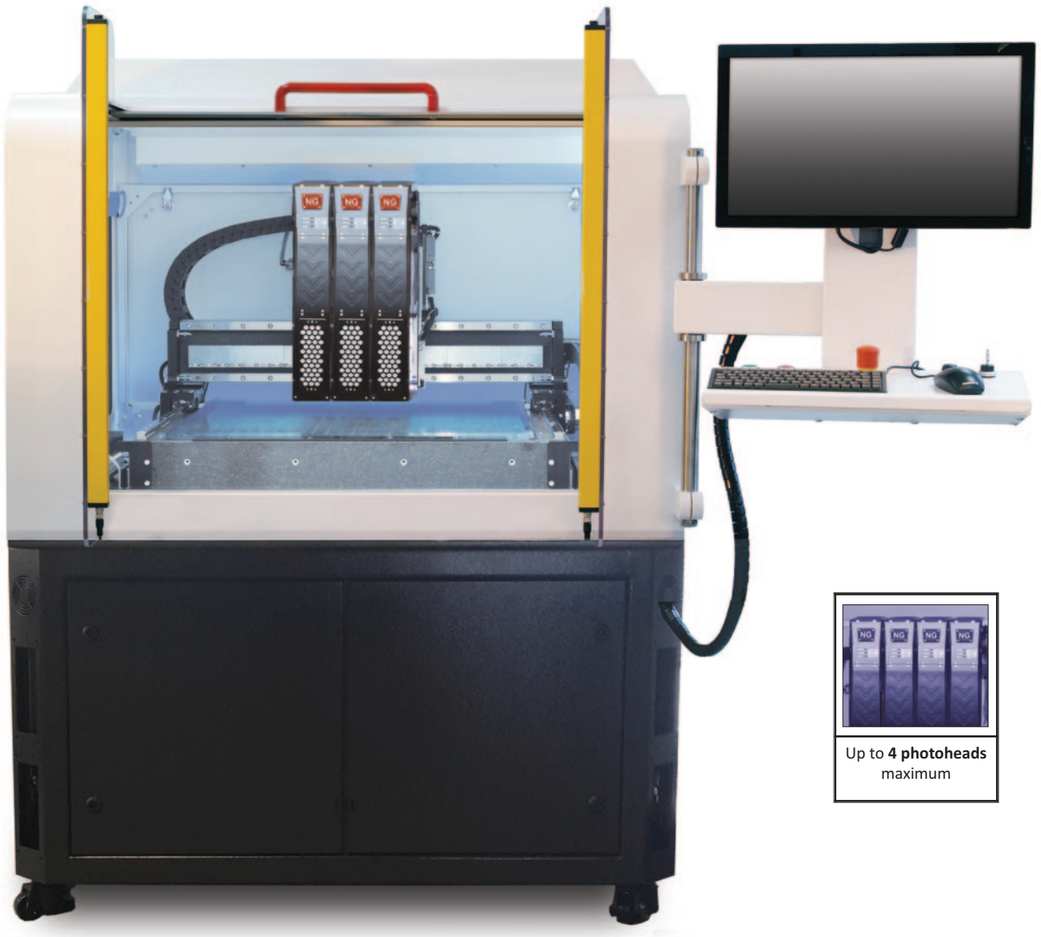
Up to 2x more Imaging Power

Full area high resolution scaling

DART Yield Improvement tool

APPLICATION	15 Micron			30 Micron		
	1LE	2LE	3LE	1LE	2LE	3LE
Inner Layer	22	34	46	34	50	63
Outer Layer	20	31	42	23	39	50
Soldermask	9	15	21	10	17	23

Note 1: All values include imaging both sides, load and unload times, 18" x 24" [457 x 610mm]
Note 2: All values assume high speed resist types, other resists available upon request
Note 3: All values are panels/hour



Up to **4 photoheads** maximum

2200L CLASS OVERVIEW

Machine Type	MIVA 2230L DI	MIVA 2230L DI duo	MIVA 2230L DI trio
No. Of Photoheads	1	2	3
Max. image size	22" x 30" * (559mm x 762mm)	24" x 30" (610mm x 762mm)	24" x 30" (610mm x 762mm)
Media sizes from	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)
Approximate imaging time for 18" x 24" side (457mm x 610mm) LDI resist 30mJ/cm²	33s	20s	15s
Approximate imaging time for 18" x 24" side (457mm x 610mm) soldermask 250mJ/cm²	130s	75s	50s
Minimum structures	30µm	30µm	30µm

* 24" x 30 " on request

Machine Type	MIVA 2215L DI	MIVA 2215L DI duo	MIVA 2215L DI trio
No. Of Photoheads	1	2	3
Max. image size	22" x 30" * (559mm x 762mm)	24" x 30" (610mm x 762mm)	24" x 30" (610mm x 762mm)
Media sizes from	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)
Approximate imaging time for 18" x 24" side (457mm x 610mm) LDI resist 30mJ/cm²	60s	36s	25s
Approximate imaging time for 18" x 24" side (457mm x 610mm) soldermask 250mJ/cm²	130s	75s	50s
Minimum structures	15µm	15µm	15µm

Machine positional Accuracy: Over 18" x 24" @21°C +/- 1°C	absolute: ± 0.4 mil / 9 µm
	repeatability: ± 0.2 mil / 4 µm
Physical size:	H: 70" / 178 cm, W: 52" / 132 cm, D: 67" / 170 cm; Weight: 980 kg
Power requirement:	400-480 VAC, 50/60 Hz, 5.5 kW (900 W when idle!)
Compressed air:	Integrated gas filtering system for 120 L/min @ 6 bar or air compressor optional
Technology:	DMD Raster Image Projection Technology / Solid state UV light sources
Environment:	Dependent on resist/emulsion sensitivity – yellow or red safe light conditions recommended for loading panels or other media
Recommended temperature/humidity:	21°C 50% RH
Media:	Resist coated panels, UV films, solder mask, red sensitive or orthochromatic phototooling films or masks up to 12mm thick
User dialogue:	Simple instructions for programming and operation by keyboard or remote control
Communications:	Local area network, Removable media.
Protocol emulations:	Gerber RS 274-X, PostScript, TIFF, others on request
User interface:	xDI Multihead control program (Windows compatible)
Panel registration:	Inbuilt coaxial registration camera

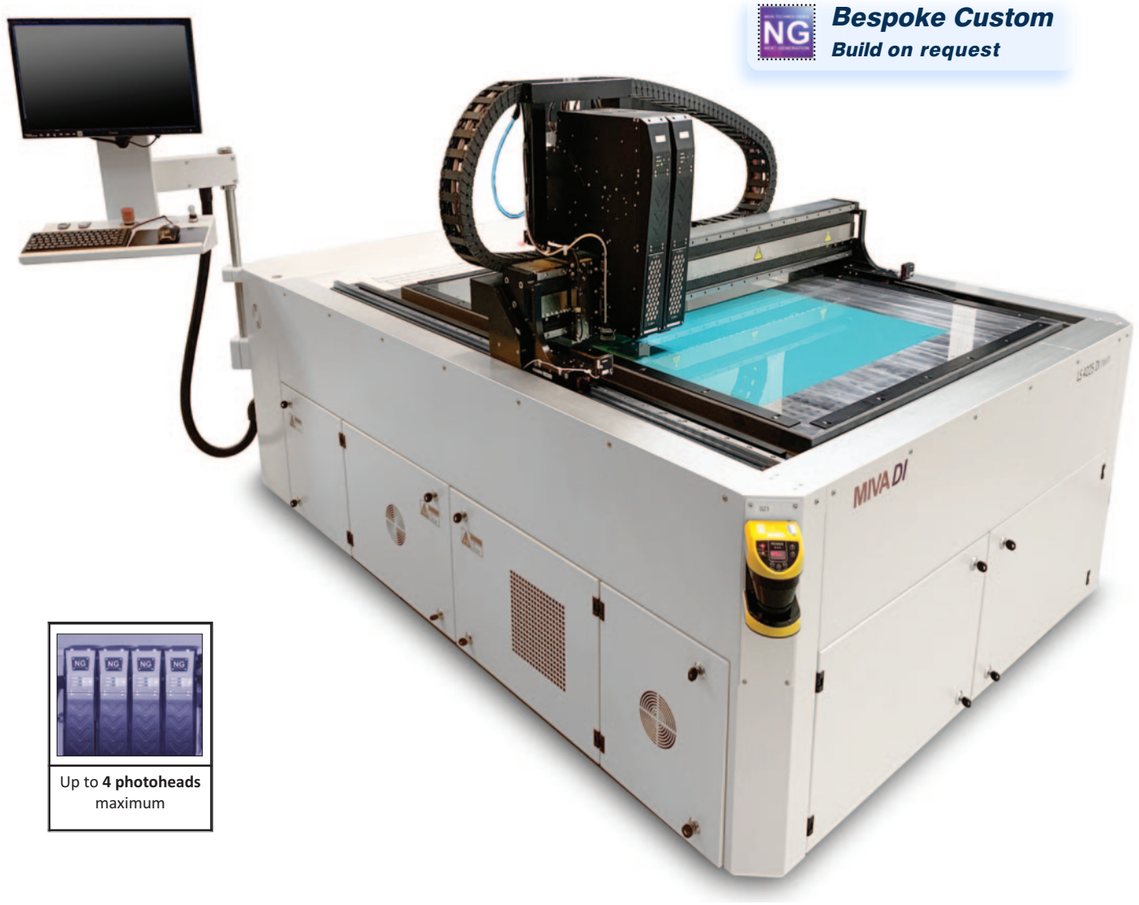
MIVA 2200L

Direct Imager
Next Generation Series

APPLICATION	15 Micron			30 Micron		
	1LE	2LE	3LE	1LE	2LE	3LE
Inner Layer	22	34	46	34	50	63
Outer Layer	20	31	42	23	39	50
Soldermask	9	15	21	10	17	23

Note 1: All values include imaging both sides, load and unload times, 18" x 24" [457 x 610mm]
Note 2: All values assume high speed resist types, other resists available upon request
Note 3: All values are panels/hour

- ***Up to 2x more Imaging Power***
- ***Full area high Resolution scaling***
- ***DART Yield Improvement tool***
- ***XXL Image area***
  30" x 60" or 42" x 60"
- ***Bespoke Custom***
  Build on request



Up to **4 photoheads** maximum

3000L CLASS OVERVIEW

Machine Type	MIVA 3030L DI	MIVA 3030L DI duo	MIVA 3030L DI trio
No. Of Photoheads	1	2	3
Max. image size	30" x 60" (762mm x 1524mm)	30" x 60" (762mm x 1524mm)	30" x 60" (762mm x 1524mm)
Media sizes from	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)
Approximate imaging time for 18" x 24" side (457mm x 610mm) LDI resist 30mJ/cm²	33s	20s	15s
Approximate imaging time for 18" x 24" side (457mm x 610mm) soldermask 250mJ/cm²	130s	75s	50s
Minimum structures	30µm	30µm	30µm

* 24" x 30 " on request

Machine Type	MIVA 3015L DI	MIVA 3015L DI duo	MIVA 3015L DI trio
No. Of Photoheads	1	2	3
Max. image size	30" x 60" (762mm x 1524mm)	30" x 60" (762mm x 1524mm)	30" x 60" (762mm x 1524mm)
Media sizes from	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)	2" x 2" (50mm x 50mm)
Approximate imaging time for 18" x 24" side (457mm x 610mm) LDI resist 30mJ/cm²	60s	36s	25s
Approximate imaging time for 18" x 24" side (457mm x 610mm) soldermask 250mJ/cm²	130s	75s	50s
Minimum structures	15µm	15µm	15µm

Machine positional Accuracy: Over 18" x 24" @21°C +/- 1°C	absolute: ± 0.4 mil / 9 µm
	repeatability: ± 0.2 mil / 4 µm
Physical size:	H: 69"/175cm, W: 59"/150cm D: 100"/254cm; Weight: 2325 kg
Power requirement:	400-480 VAC, 50/60 Hz, 5.5 kW (900 W when idle!)
Compressed air:	Integrated gas filtering system for 120 L/min @ 6 bar or air compressor optional
Technology:	DMD Raster Image Projection Technology / Solid state UV light sources
Environment:	Dependent on resist/emulsion sensitivity – yellow or red safe light conditions recommended for loading panels or other media
Recommended temperature/humidity:	21°C 50% RH
Media:	Resist coated panels, UV films, solder mask, red sensitive or orthochromatic phototooling films or masks up to 12mm thick
User dialogue:	Simple instructions for programming and operation by keyboard or remote control
Communications:	Local area network, Removable media.
Protocol emulations:	Gerber RS 274-X, PostScript, TIFF, others on request
User interface:	xDI Multihead control program (Windows compatible)
Panel registration:	Inbuilt coaxial registration camera

MIVA 3000L
Direct Imager
Next Generation Series

APPLICATION	Wavelength Specific LED			Wavelength Specific Laser		
	Imaging Speed (mm²/s)	Imaging Time for 100x100mm (min)	Imaging Time for 300x300mm (min)	Imaging Speed (mm²/s)	Imaging Time for 100x100mm (min)	Imaging Time for 300x300mm (min)
1,5µ				10.4	16	144
2µ	5.2	32	288	N/A	N/A	N/A
3µ	11.7	14.2	128	23.4	7.1	64
6µ	46.9	3.5	32	93.8	1.8	16
12µ/3µ twin	375	0.5	4			

- Throughput assumes 0.5 micron AZ1518 resist
- 10 micron quad assumes 15 micron high speed resist

DART Yield Improvement Tool

LED Laser LE Selectable

305mm x 407mm Imaging Area

Dual Resolution Selectable

1200MW CLASS OVERVIEW

Machine type	1206L MW	1206L MW twin
No.of photoheads	1	2 (12µm/6µm)
Max image size	12" x 16" 305 mm x 407 mm	12" x 16" 305 mm x 407 mm
Media sizes from	2" x 2" 50 mm x 50 mm	2" x 2" 50 mm x 50 mm
Minimum structures	6µm	(12µm/6µm) selectable

Machine type	1203L MW	1203L MW twin
No.of photoheads	1	2 (12µm/3µm)
Max image size	12" x 16" 305 mm x 407 mm	12" x 16" 305 mm x 407 mm
Media sizes from	2" x 2" 50 mm x 50 mm	2" x 2" 50 mm x 50 mm
Minimum structures	3µm	(12µm/3µm) selectable

Machine type	1202L MW	1202L MW twin
No.of photoheads	1	2 (12µm/2µm)
Max image size	12" x 16" 305 mm x 407 mm	12" x 16" 305 mm x 407 mm
Media sizes from	2" x 2" 50 mm x 50 mm	2" x 2" 50 mm x 50 mm
Minimum structures	2µm	(12µm/2µm) selectable

Machine type	1201L MW Laser
No.of photoheads	1
Max image size	12" x 16" 305 mm x 407 mm
Media sizes from	2" x 2" 50 mm x 50 mm
Minimum structures	1.5µm

Positional Accuracy: @21°C	Positioning resolution 20 nm
	Linearity over 100 mm: 0.4 µm
	Registration: (3σ): 2,5 µm
Physical size:	H: 71" / 180 cm, B: 48" / 122 cm, T: 60" / 153 cm; Weight: 650 kg
Power requirement:	220-240 VAC, 50/60 Hz, 3.5 kW (550 W when idle!)
Compressed air:	Integrated gas filtering system for 60 L/min @ 8 bar or air compressor optional
Technology:	DMD Raster Image Projection Technology / Solid state UV light sources
Environment:	Dependent on resist/emulsion sensitivity – yellow or red safe light conditions recommended for loading panels or other media
Recommended temperature/humidity:	21°C 50% RH
Media:	Resist coated masks or panels up to 12mm thick, UV sensitive films.
User dialogue:	Simple instructions for programming and operation by keyboard or remote control
Communications:	Local area network, Removable media.
Protocol emulations:	Gerber RS 274-X, PostScript, TIFF, others on request
User interface:	xDI Multihead control program (Windows compatible)

MIVA 1200MW

Mask Writer
Next Generation Series

MIVA NEXT GEN TECHNOLOGY

Next Generation Imaging incorporates major advances in our tuneable quad-wave LED powered projector technology, new methods of data processing, an external rasterisation engine, no capture related data reloads, full area high resolution scaling, yield and quality improvement tools and much more.

Throughput: NextGen Light Engines are highly powerful and allow you to choose fewer light engines for your throughput, so lowering machine investment costs.

Quad-wave: NextGen employs 360, 370, 390, 405nm LEDs. These can be tuned to match resist sensitivity for imaging efficiency and wall steepness tuning, as well as allowing flexibility in the choice of resist and soldermask types.

DART Compliant: NextGen includes the External Rasterization Engine. This allows high speed rasterization on the fly including digital linewidth compensation and scaling with no wait-states. Use the DART Optimization Suite for full process control.

Vision Enhancements: Miva´s new vision technology permits feature measurement and improves target acquisition. NextGen´s larger field of view makes panel placement easy and can eliminate the need for capture related data reloads.

Resolutions: NextGen is currently available in 30µm, 15µm or 6µm resolution.

MIVA DART TECHNOLOGY

DART Optimization Suite:
DART is a quality and yield improvement tool.The DART OS module allows the user to check develop, etch and plating performance everywhere on the panel, then make process adjustments based on the topographical map such as spray bar pressures, AB etch rates, and the like.

External Rasterization Engine:
Provides high speed rasterization at 10x system
resolution for high speed, precision digital feature manipulations.

First Article Tool:
The first article tool allows operator level confirmation of feature size post develop/etch/plating. Coupon measurement results are applied to digitally compensate feature sizes.

Process Control Tool:
Miva´s DART system allows you to integrate develop, etch and plating results into the digital imaging process to improve the quality of panels leaving all of these production stages. DART is a feature of the MIVA imaging tool and allows the DI to interpret external process data algorithmically and test coupons visually, and to subsequently (and automatically) implement appropriate changes at the imaging stage, such as feature size, scaling, registration, uniformity across the panel etc, to improve feature size, registration, and total yield.

MIVA SERVICE CONTRACTS OVERVIEW

MIVA SERVICE

MIVA machines are robust, reliable and low-maintenance designed. If you need assistance, we and our worldwide service partners are ready to help.

Direct response: telephone or video call, Email or chat for immediate response.

Remote diagnostics: remote machine control, remote diagnostics, upgrades.

On-site service: our globally based local service partners are ready to visit if needed.

Schooling, training: machine operators are schooled on-site as part of each machine installation or if required, thereafter.

Yield and quality optimisation: DART Optimization Suite is MIVA´s set of machine-integrated tools which use the DI as a measurement and control system to compensate your PCB quality/regularity issues caused by variations in other production processes such as drilling, developing, plating and etching lines. We offer bespoke customer training in DART according to your needs and production processes.

Service contracts: we acknowledge some customers´ need for a service plan, and offer three classes of maintenance contract.

Optimum Protection, Maximum Flexibility

Comparison of MIVA Service Contracts

SERVICES	GOLD	SILVER	BRONZE
Technical hotline support Unlimited access to support hotline via phone, e-mail , TeamViewer	1	2	3
Environmental Filters All environmental filters changed Chiller Filters changed	1	2	3
Remote assistance Online diagnostics Online configuration support	1	2	3
Preventive maintenance Inspection and calibration of mechanics in recommended service intervals	1	2	
Software Upgrades Free provision of further developed versions of licensed MIVA software	1	2	
Priority service and support Guaranteed, faster reaction time to support, service and repair requests	1	2	
Extended Warranty Full machine coverage All parts and service costs included	1		

Flatbed Imaging Systems

MADE IN GERMANY

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