

Mini MASTER laser micromachining workstation

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KEY FEATURES

- ✓ Nano or pico second lasers
- ✓ Selection of harmonics
- ✓ Galvo scanners or positioning stages
- ✓ Fast payback

PRODUCT OVERVIEW

Mini MASTER is a fast payback laser micro machining workstation from **Elas, Ltd**. A wide selection of laser parameters, up to three available wavelengths and micromachining techniques developed in our laboratories allow owners of the **Mini MASTER** to fulfill their specific needs for applications in Research and Development laboratories or small batch production.

Mini MASTER is used for ablation, surface and intra-volume marking, drilling or similar processing of various materials. Know-how in the field of laser micromachining allowed us to adapt **Mini MASTER** for user-friendly operations particular to our customer's needs. The **Mini MASTER** laser micromachining system can be equipped with an Nd:YVO₄ either nanosecond or a picosecond laser, a fast and precise galvo-scanner or fast high precision X-Y positioning long travel stages.



Front view of Mini MASTER

Lasers

From the very beginning the **Atlantic** Series has been designed to be a versatile tool for a variety of industrial material processing applications. The Atlantic is a compact laser system with 16 W of output power at 1064 nm. It features high pulse energy, exceptional beam quality, fast repetition rates and 10 ps pulses. Designed for hands-free operation, the Atlantic offers maximum reliability due to an optimized layout, PC controlled operation, a built-in self-diagnostics system and advanced status reporting. The superior beam quality allows easy focusing of the laser beam into the smallest spot size at various working distances and the ability to reach laser fluences sufficient for processing virtually any material.

Baltic series diode-pumped solid state Nd:YVO₄ lasers offer stable and cost-effective operation at high repetition rates. The innovative electro-optical Q-switch used in this series supports a generation of record-short pulses given the high power of these nanosecond lasers. The utilization of sealed cavity ensures stable and reliable operation in diverse conditions. Diode pumped laser technology combined with **SCA** micro machining software enables customer to achieve high productivity and flawless quality.



DPSS laser Baltic HP

Software

All parts of this system are controlled by **SCA** software, which collects input information from the user or connected external devices and manages all system parameters during the machining process. It enables the user to define all principal parameters of machining process size, density of points, marking speed, etc... The software accepts input files in dxf, bmp, plt formats. The laser output power is calibrated periodically, ensuring long term stability of machining performance.

Laser safety

An ergonomic design and Class 1 laser safety of the standalone workstation ensures a safe and comfortable working experience for user of **Mini MASTER**.

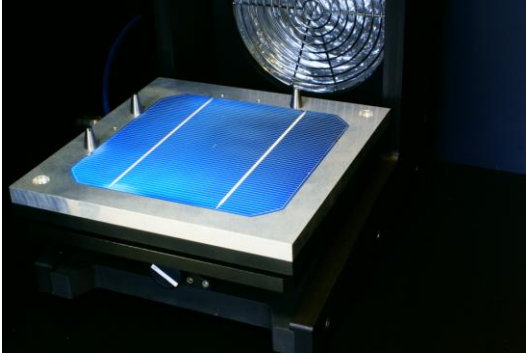
HARDWARE FEATURES

Mini MASTER standard hardware features:

- ✓ Baltic Series or Atlantic Series DPSS laser* with power supply and cooling unit
- ✓ Beam delivery optics
- ✓ Fast and precise galvo-scanner
- ✓ Power meter for laser radiation

- ✓ Vacuum chuck for sample holding
- ✓ Dedicated control computer for laser and system control
- ✓ Control display and keyboard
- ✓ Workstation control unit

(*Parameters of laser are subject to adapt for specific application)



Optional features:

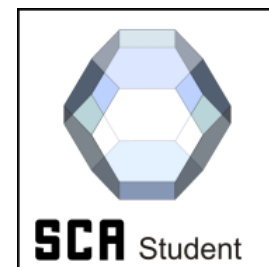
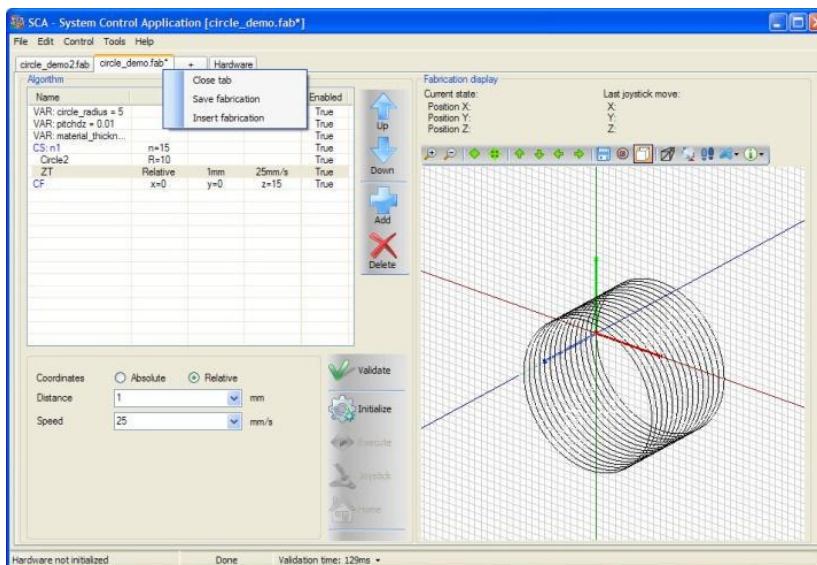
- ✓ Observation window
- ✓ CCD vision system
- ✓ Dust extraction system
- ✓ X-Y positioning stage
- ✓ Manual or automatic Z axis
- ✓ High resolution *Machine Vision* system with sample recognition

SOFTWARE FEATURES

SCA software integrates design (CAD), manufacturing (CAM) and device control functionality for accurate micromachining.

Standard software features:

- ✓ Operating system - Windows 7, 32 bit
- ✓ Algorithm table with easily selectable/editable parameters
- ✓ Graphical trajectory preview window WYSIWYG
- ✓ File format support for .bmp, .plt, .dxf
- ✓ Grayscale Bitmap fabrication mode
- ✓ Text fabrication mode (numbers, text, symbols, spaces, fonts)
- ✓ Virtual (keyboard or GUI) joystick
- ✓ Current position display
- ✓ Object (point, line, image) selection; ability to rotate, translate or scale selected object



Customized features:

- ✓ Additional functionality, custom commands
- ✓ Control of optional peripherals
- ✓ Working field alignment

SCA working window

PRODUCT TECHNICAL PARAMETERS

LASERS

MODEL: EKSPLA BALTIC

Type	DPSS Q-switched		
Wavelength	1064 nm	532 nm	355 nm
Average Power	9 W	3.5 W	2.5 W
Pulse Frequency	2.5–100 kHz		
Pulse width	6–24 ns		
M ²	< 1.3		
Spatial mode	TEM₀₀		

MODEL: EKSPLA BALTIC HP

Type	DPSS Q-switched		
Wavelength	1064 nm		532 nm
Average Power	20 W		8 W
Pulse Frequency	5 –100 kHz		
Pulse width	10-30 ns		8–24 ns
M ²	< 1.3		
Spatial mode	TEM₀₀		

MODEL: EKSPLA ATLANTIC

Type	DPSS Nd:YVO ₄		
Wavelength	1064 nm	532 nm	355 nm
Average Power	16 W	8 W	4 W
Pulse Frequency	Single pulse - 500 kHz		
Pulse duration	<10 ps		
M ²	< 1.5		
Spatial mode	TEM₀₀		

GALVO-SCANNER (standard)

Parameter	Value
Clear aperture	9-15 mm
Image field	50 x 50 mm ²
Spot size	30-40 μm
Scan step	10 μm

SYSTEM POWERING AND AMBIENT REQUIREMENTS

Main Supply Input Voltage	240VAC
Main Supply Input Frequency	50-60 Hz
Power consumption	< 3 kW
Operating temperature:	$\pm 1^\circ$ in range from 18° to 27°C
Storage temperature:	$5 - 40^\circ\text{C}$
Relative humidity:	10 – 80 % (non-condensing)
Pollution	Pollution degree 2 (normally only non-conductive pollution).
Use	Indoor use only

* - To ensure precision of stages and pulse energy stability ambient operating temperature should be kept $\pm 1^\circ\text{C}$. (For your reference temperature change over 1°C correspond to $\sim 11 \mu\text{m}$ change in distance over 200 mm range).

SERVICES



- ✓ Technology development for specific material processing
- ✓ Sample processing

APPLICATIONS

Examples of processed materials include

- ✓ Polymer films
- ✓ Silicon
- ✓ Glass
- ✓ Metals
- ✓ Sapphire
- ✓ Tungsten Carbide, etc.

