

A DIVISION OF FONON TECHNOLOGY INTERNATIONAL

# ***SBM1200 FL***

**FIBER LASER CUTTING & ENGRAVING SYSTEM**

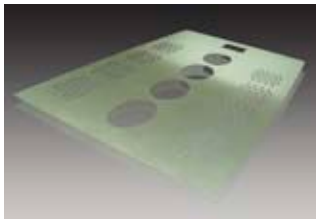
This system will achieve a level of quality and detail that is unprecedented in the industry for laser cutting and engraving. It can cut/engrave stainless steel, mild steel, copper, brass, aluminum, non transparent plastics, plaques, create stencils, and more. It has a replaceable nesting basket and can perform effective N<sub>2</sub>, Ar or O<sub>2</sub> gas-assisted cutting under pressures of up to 250 psi. Ease of installation gives the system “plug-and-play” characteristics and a quick startup time.

The SBM1200 FL will help quicken production time and lower manufacturing costs. Fiber Laser systems reduce the cost of ownership, maintenance and dramatically improves overall production quality. A high output laser power with low energy consumption, resulting in operating cost savings and a quick return on investment. Due to it's direct drive motor with integrated software control, the SBM1200 FL preserves a large amount of detail when cutting and engraving. The software allows Laser Photonics to import any image into the software as a prepared solution for engraving/cutting.

### **Standard Features**

- High pressure gas assist N<sub>2</sub>, Ar or O<sub>2</sub> gas-assisted cutting under pressures of up to 250 psi
- Latest generation Ytterbium 1,000 to 5,000 watt CW upgradable Fiber Laser (1,000 watt increments)
- Ideal applications are highly reflective material (1064 nm laser wavelength)
- Software controlled X-Y orthogonality
- Flatbed 51" by 51" cutting table
- Class 1 laser safety enclosure





### **Applications & Materials**

- Cutting, Marking & Deep Engraving
- High-speed sheet metal cutting
- Automotive frames cutting
- Coated & Plated Metals
- Thick Coating Removal
- Anodized Aluminum
- Opaque Plastics
- Medical devices
- Laser sintering
- Silicon cutting
- Stainless Steel
- Blank cutting
- Plate cutting
- Alloy Metals
- Composites
- Aluminum
- Mild Steel
- Titanium
- Graphite
- Copper
- Marble
- Stone
- And More

### **System Capabilities**

- Save valuable work and floor space, the unit has a small foot print, is Ethernet ready and Plug & Play capable
- Fully software-controlled mechanical geometry alignment eliminating special requirements for installation
- No reeducation required for experienced CNC operators (G-code programming)
- Fastest cutting speed on the market for comparable systems
- Low power consumption, no need for high voltage outlet
- No optical system alignment, no laser service necessary
- No laser service knowledge required from the operator
- Highest cutting quality available from 1064 nm lasers
- Lowest operating cost among all laser types
- Ease of installation allows for quick start-up
- No replacement parts on laser necessary
- No beam delivery system maintenance
- No alignment after optics replacement
- Software alignment on orthogonality

### **Advantages of Fiber Laser Cutting**

- Materials do not require post processing of edges
- Identical cut quality in any area of the cutting table without using sophisticated CNC controlled beam collimators
- Full control of the laser power from 1-100% makes it a true universal tool for cutting of any material thickness limited only by the maximum power
- Easy replaceable fiber cable in emergency situations utilizing the integrated fiber coupler
- The cutting of aluminum, copper, brass, and high reflective alloys is natural for fiber lasers and impossible for CO<sub>2</sub> lasers of comparable power
- Superior edge quality for multiple material selection, cutting accuracy and intricacy makes fiber laser cutting technology the most universal for industrial cutting applications
- Due to very low heat levels, industrial cutting of the intricate shapes and patterns is an every day regular job for the fiber laser

### **Superiority of Fiber Lasers**

- Identical cut quality in any area of the cutting table without using sophisticated CNC beam collimators
- Negligible cost of ownership in comparison with other laser types, where the main factor is depreciation; The laser system will last for 20 years
- Full power control range from 1 watt to 1000 watt opens the way to cut thin and thick materials on the same laser system, while on the other laser systems, minimal power is limited to the lasing threshold and is typical from 20% to 50% depending on laser type
- Simple operation, like changing a light bulb, affordable by any level of CNC laser machining
- No beam delivery system purging and protection from contamination and industrial dust
- No maintenance or service is required on the fiber laser making it ideal for 24/7/365 days a year of heavy duty industrial operation
- No laser gas, gas delivery and control equipment, gas pumps and leakage detection
- No mechanical moving parts and sophisticated optical components at all
- No resonators to maintain, check, or align
- No optical components to clean or replace
- No system realignment

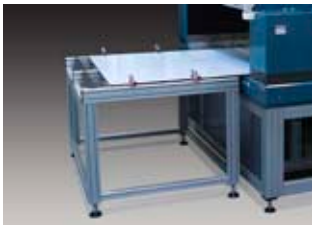
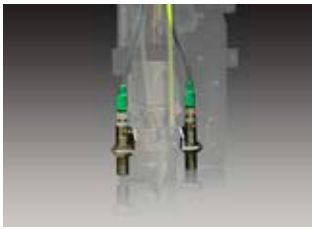


## Comparable Advantages of Fiber Laser Over Nd:YAG

	20 Watt TEMoo Fiber Laser	50-100 Watt Multimode (Lamp or Diode) 20 Watt TEMoo Diode Nd:YAG Laser
<b>Laser System</b> • Laser and power supplies • Computer and software • Q-switch RF driver • Scan head and control cards	\$47,500	\$55,000 - \$65,000
<b>Reliability</b> MTBF (Mean Time Between Failure)	50,000 to 100,000 Hours	500 to 1,000 Hours (Lamp-pumped) 10,000 to 20,000 Hours (Diode-pumped)
<b>Consumables</b>	\$0 Note: Fiber Laser modules can be repaired – average repair costs range from \$1,000 to \$5,000 USD	\$2,000 - \$15,000 (Lamps - \$100 each) (Diode packs - \$5,000 to \$12,000 each)
<b>Power Consumption</b> (Two eight hour shifts running 365 days at \$.04 kW)	\$39.71 yearly 170 W an hour	\$1,401.60 yearly 6 kw an hour
<b>Maintenance</b>	• No maintenance • No consumables • No cleaning or aligning of mirrors or Beam path • No filters (Chiller)  Cost: \$0.00	• Optical path requires often adjustments to optimize power output • Periodic replacement of flash lamps, diode packs, and solid state crystals • Extremely temperamental diode packs often require factory-trained technicians–takes several hours in many cases • Cleaning, replacement and aligning of laser mirrors  Cost: \$1,500 - \$10,000 (Individual results may vary, diode pumped systems require significant training for replacement procedure)
<b>Power Efficiency</b>	Up to 50%	2-3% (0.2% with 3x Nd:YAG)
<b>Beam Quality</b>	Round & concentric Near M2=1 (<1.05)	Not symmetric on both axes
<b>Spot Size</b>	Due to the excellent M2, <b>spot size is 50% smaller than Nd: YAG.</b> <b>Requires less power</b> for the same result in comparison with the Nd:YAG system.	Significantly bigger than the Fiber Laser. Requires more lasing power to achieve the same result.
<b>Optical Path/Beam Path</b>	Flexible Cable (up to 50m)	<b>Mirrors and optical path</b> Loss of beam quality and significant power drop-off with fiber delivery scan head system
<b>Cooling</b>	Air cooled	De-ionized (DI) water
<b>Size</b>	19" rack mount unit	Large footprint
<b>Chiller</b>	No Chiller necessary up to 200 watt Q-switched (pulsed) or CW. Cost: \$0	30x watt to laser output power Cost: \$5,000 - \$8,000 (Replacement required every 1 – 2 yrs)
<b>Total Cost of Ownership First Year</b>	\$47,539.71	\$99,400.00
<b>You Save First Year</b>	\$51,860.29	

## Fiber Laser Technical Specifications

<b>Type</b>	Ytterbium Fiber Laser
<b>Operation Mode</b>	CW or Modulated
<b>Wave Length</b>	1075 nm +/- 5
<b>Output Power</b>	1,000W standard, up to 5,000W optional
<b>Beam Quality M2</b>	<1.15
<b>Polarization</b>	Random
<b>Maximum Modulation Frequency kHz</b>	10
<b>Electrical requirements V</b>	240/380/460
<b>Power consumption Total (kW)</b>	10.3
<b>Fiber Laser 1000 Watt (kW)</b>	5.0
<b>Water Chiller (kW)</b>	3.4
<b>Cutting System (kW)</b>	1.9
<b>Estimated diode life time (Hours)</b>	100,000
<b>Cooling method</b>	Water
<b>Maintenance required</b>	(None) Maintenance-free operation



## Cutting Head

	Standard	Optional
Z-axis travel	2"	
Lens selection	70 mm	100 mm 120 mm
Auto focus	Ultrasonic for all materials	Capacitor for metals
Nozzle selection	1.2 mm	1.5 mm 2.0 mm
Crash protection		Optional
Red aiming beam		Optional

## Motion Systems

<b>Travel Method</b>	X-, Y and Y'- axis direct drive
<b>Control Method</b>	X-, Y, Y'-, and Z-axis CNC controlled (Four axis simultaneously controlled). Upgradeable to 6 axis's.
<b>Speed to Laser Power interpolation</b>	X, Y, V(Speed), P(Laser Power) interpolation
<b>Travel Distances</b>	X = 48.3" Y = 49.5" Z = 2.0"
<b>Feed Rate</b>	X = 1,200" / min Y = 1,200" / min
<b>Rapid Rate</b>	X = 2,300" / min Y = 2,300" / min Z = 35" / min
<b>Maximum Worksheet Loading Capacity</b>	200 lb
<b>Repeatable Positioning Accuracy</b>	±0.01 mm
<b>Minimal Addressable Resolution</b>	0.001 mm
<b>Drive feed Method</b>	Direct Drive
<b>Assist Gas Type Selector</b>	Automatic selection
<b>Machine Table Height</b>	31.3" [796 mm]
<b>Total Machine Weight</b>	Total (Lbs) 1,536 lbs • Cutting Machine: 832 lbs • Water Chiller: 260 lbs • Fiber Laser: 444 lbs
<b>Power Supply (only for machine)</b>	AC, 1 phase, 120 V, 1,9 kW
<b>Air Supply (only for machine and when the shop air assisted cutting is used)</b>	0.17 Mpa (25 psi or 1.76kgf/cm2), 570 L/min (20.13 ft3/min)

## Additional System Options

- Autofocus System for General Materials
- Special Autofocus System for Metals
- Holding Clamps
- Extension Table
- DI Water Filter
- Vacuum Table
- Vision System
- Cutting Table
- Fiber Coupler
- Water Chiller
- Assist Gas
- Exhaust



## CNC Controller

<b>CNC unit</b>	State of the art PC based CNC motion control
<b>CNC Control Method</b>	Closed loop method
<b>Programming</b>	Native G-code programming
<b>Control Functions</b>	X-, Y, Y', and Z-axis simultaneously controlled with Laser Power and Velocity
<b>Input Methods</b>	Ethernet, CD, USB flash Memory, 3.5" disk
<b>Position Synchronized Output</b>	Integrated hi-speed Position Synchronized Output (PSO) for laser firing or position latching applications
<b>Motion capabilities</b>	point-to-point; linear, circular, helical and spherical interpolation; velocity profiling; electronic gearing; on-the-fly trajectory modification; high-speed I/O; camming
<b>Coordinated Motions</b>	RS-274 standard G-code motion including linear, circular, helical and spherical interpolation, cutter compensation, normalcy, parts rotation, mirroring, path retrace, polar transformations and cylindrical transformations, scaling
<b>Additional features</b>	Digital current loops for improved motion and stability
<b>Vision system</b>	Supports extra vision system for positioning and beam registration
<b>Least input increment</b>	0.001 mm
<b>Minimum positioning accuracy</b>	0.005 mm
<b>Program storage capacity</b>	Unlimited within PC memory capabilities
<b>Operating modes</b>	Edit / Automatic / Manual
<b>Display functions</b>	Laser Power, Laser Conditions, Position information, Cutting Conditions, Messages, Diagnosis, Settings
<b>Controller/Drive Interface</b>	Firewire
<b>Display</b>	15" TFT LCD





### Advanced Control Software

Motion generation and synchronization are centralized at the PC. Motion execution is decentralized at the drives. A3200 operates on any standard desktop or industrial PC. Servo loops are closed on the drive.

The SBM1200 FL utilizes the A3200 software for coupling the vision module with the motion system that coordinates the laser.

### Advanced Control Software Benefits

- Higher quality output (accuracy and precision) due to fully digital drive and advanced servo algorithms
- Simplified integration as all major automation components are bundled into one platform
- Lower startup and life cycle cost due to lower component count and reduced engineering time
- Faster startup and change over results from fully integrated motion platform, easy to use setup tools and extensive diagnostics
- Laser photonics uses bobcad/cam for writing g-code however, any software will work
- Higher throughput due to high performance control, network, and high power drives
- User interface flexibility due to local or remote processing
- Higher reliability due to fewer components

### SBM 1200 FL Dimensional Drawings





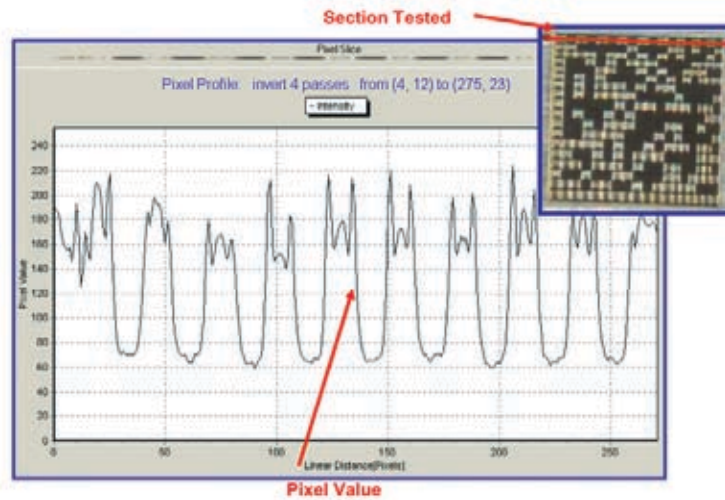
## Application Research Center

Laser Photonics maintains an applications lab for processing customer samples and assisting with process development. Our applications lab has the latest testing equipment to analyze all of your application needs.

For marking applications, we provide the highest quality analysis of each and every mark using our Mark Quality Assessment™ (MQA™) software. With our MQA™ software, we have the ability to guarantee and verify the accuracy and quality of our marks.

The screen shot below demonstrates how the MQA™ software reads the level of pixels in the material marked. The section in red has been analyzed with the MQA™ software. The high and low pixel values demonstrate the overall contrast of the mark.

This procedure can be applied to various different marking processes and types generated by our Fiber Laser marking systems. We will prepare and research all applications within a matter of two to three weeks and provide a detailed report free of charge.



### Advanced Support

- Remote laser diagnostics through TCP/IP protocol
- Remote diagnostics and upgrades
- Remote systems restore
- Multilingual software
- World wide support
- Built in help index
- Remote training

**2 year warranty  
on laser components  
with 5 year optional program**

### International Support

*Multilingual software with  
worldwide support*

- Australia
- Brazil
- Canada
- China/Hong Kong
- India
- Malaysia
- Mexico
- Philippines
- Qatar
- Russia
- Singapore
- Taiwan
- Thailand
- Turkey  
and more





**Safety Considerations During Operation**

1064 nm wavelength laser light emitted from this laser system is invisible and may be harmful to the human eye. Proper laser safety eye wear must be worn during operation.

**21 CFR 1040.10 Compliance**

This product is designed for OEM integration into other equipment.

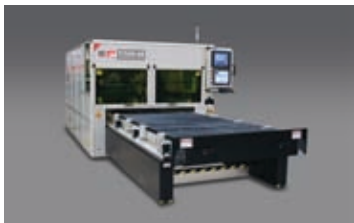
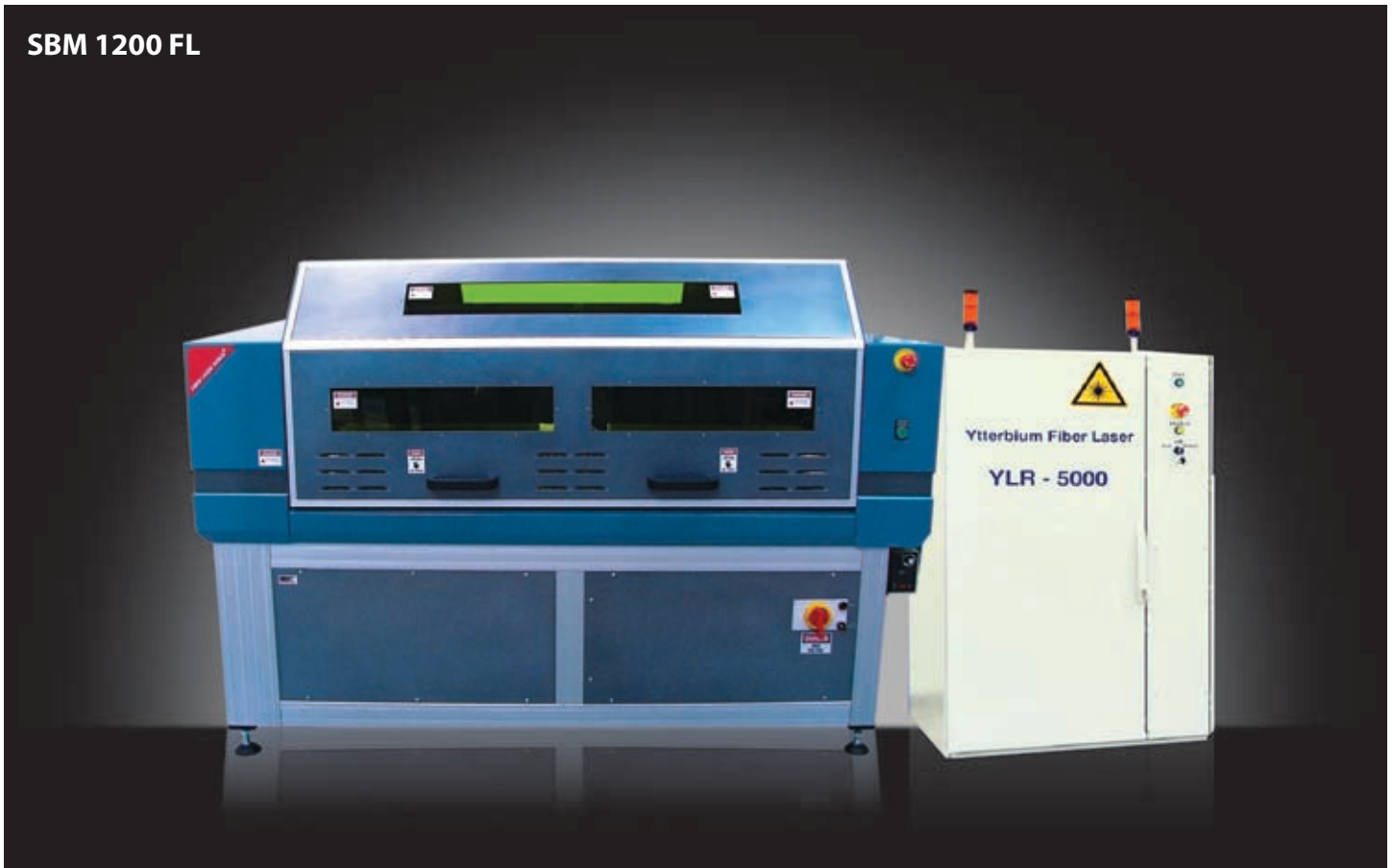
The product is a Class 4 laser as designated by the CDRH and it does NOT MEET the full requirements for a stand-alone laser system as defined by 21 CFR 1040.10 under the Radiation Control for Health and Safety Act of 1968. It is the responsibility of the equipment manufacturer to meet all of the regulatory requirements for the final system.



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## Laser Photonics - Product Range

### SBM 1200 FL



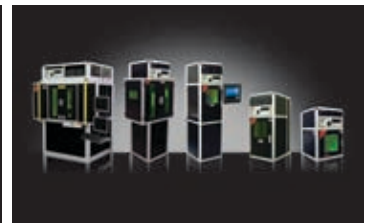
**Titan Series**



**OEM Marking Kits**



**Handheld**



**FiberTower™ Series**

Laser Photonics, LLC is the industry leader in developing high-tech Fiber and CO<sub>2</sub> laser systems. Laser Photonics exclusively specializes in advanced, innovative, latest generation laser systems, processes and technologies. We focus on cutting edge Fiber Laser technology for material processing. We have delivered hundreds of Fiber Laser cutting and engraving machines to countries worldwide. Contact us to learn more about our marking, cutting and engraving systems.



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