



Em- Smart Fiber Laser

# User Manual

- To ensure correct use, please read this user manual carefully before using the product.
- To ensure safe use, please read the [Safety Instructions] in this manual
- After reading, keep this manual for future reference.

## Entry

- Please read and understand this performance specification carefully before using this product, it will provide detailed information such as product safety notices, installation method, operating procedure, maintenance and after-sales service, make sure you can use this product properly after receiving it, and make sure the delivered product is in line with the specification.
- Please follow the safety notes in this specification.
- Please contact Softgraf if this product has any quality problems. Softgraf will not be held responsible for any failure to read the instructions that result in personal injury.
- If you do not comply with every point in this specification and cause damage to the equipment, this is not our maintenance warranty coverage. Softgraf will not undertake any obligations because users have not complied with every point in this specification and caused personal injury.
- All content in this operational specification is protected by copyright, any organization and personnel are not allowed to copy, save in database without consent of Softgraf.
- Please contact us if you have any questions not related to the user manual.



## Thanks

Thanks for choosing Em-Smart laser marker, we have divided this specification into nine sections, please refer to the laser safety notices and EM-Smart product summary, product installation and use information, common failure analysis and troubleshooting. You can refer to the sections in this specification to get the solution to the problem if you encounter it during the use of EM-Smart product. You can call our after-sales service hotline or sales manager if you want to consult about technical problems.

## 1. Laser Safety Notes

### Laser Safety Classification

Improper use or handling of laser products can cause eye injuries and skin burns during use.

Please read the classification in detail to properly use and handle laser products and avoid accidents.

The wavelength and power of laser products have decided that the laser hurts the human body.

The International Electronic Commission standard divides the laser into 7 main safety levels according to the wavelength, maximum laser output power or energy of laser products.

Regardless of ordinary consumers or professional operators, everyone must familiarize themselves with the laser safety level, understand what degree of harm they represent, so that they can avoid many laser-related accidents.

Laser Safety Classification and Detailed Description:



Class 1	A very low-power laser, completely safe, emits radiation in the range of 302.5-4000 nm, the power of visible lasers (400-700 nm), operating continuously, cannot exceed 0.39 mW.
Class 1M	A laser emitting radiation in the wavelength range of 302.5-4000 nm, which is safe under normal operating conditions, may be hazardous when viewing the beam through optical instruments.
Class 2	Low-power laser emits visible radiation in the range of 400-700 nm, the power of the laser operating continuously does not exceed 1 mW, these lasers are not completely safe, but the eyes are protected by instinctive defensive reactions (blinking reflex). All laser devices with a safety class of 2 or higher must have such a sticker or print.
Class 2M	A laser emitting radiation in the wavelength range of 400-700 nm, eye protection is provided naturally by instinctive defensive reactions, may be dangerous when looking into the beam through optical devices.
Class 3R	Laser with a wavelength of 302.5-106 nm, in continuous operation the output radiation power cannot exceed 5 mW, looking into the beam through optical devices may be dangerous, for a laser emitting visible radiation in the range of 400-700 nm the eyes are protected by instinctive defensive reactions (blinking reflex).
Class 3B	Laser with wavelengths from 180-106 nm, radiation power not exceeding 0.5 W, looking directly into the beam is always dangerous, looking at an unfocused beam reflected from a scattering surface is safe provided that the viewing distance is not less than 13 cm and the viewing time does not exceed 10 s.
Class 4	The most dangerous, its use is associated with many conditions described in detail in the PN-EN 60825-1:2005 standard, a hazard may also be caused by reflected and scattered radiation, it may cause skin damage and poses a fire hazard.

## 2. Safety signs

According to the PN-EN 60825-1:2005 standard, the wavelength of the EM-Smart marking machine is 1064nm, and the output power is 20 W, which qualifies the machine for class 4 in laser safety classes. Direct or indirect exposure under the influence of light intensity will harm the eyes or skin! Although the radiation is invisible, the light beam still causes damage and can cause permanent damage to health. Safety glasses should be worn when operating the Em-Smart laser. This product may contain the following warning signs. In addition, the product contains a red light beam, the power of which is about 1mW and the wavelength is about 650nm, the laser beam focus classifies it as class 3R.



Laser Ray Warning



Warning!  
Protect your eyes and skin from direct or scattered radiation.  
Class 4 laser device



Warning! Risk of electric shock



Eye protection required



General warning sign,  
Potential harm to the human body



### 3. Emergency button

The Em-Smart product has an emergency stop button. In an emergency, press the emergency stop button and the machine will stop immediately;

The button is located on the front of the machine to the right of the main switch;

After the emergency situation is over, release the red emergency button by turning it to the right, then start the machine as usual;

The machine can also be disconnected in the standard way, by unplugging the power cable from the device.

### 4. Other safety rules

When using the machine near children, exercise special caution, do not allow minors to work on the machine.

When not using the device, cover the lens with the cover included in the set to protect it from dust or accidental damage.

Do not use the machine in a dim or dark room.

It is forbidden to disassemble the product, it may cause danger to you and people in your surroundings.

The marking machine is only suitable for materials specified in the specification or on the website [www.em-smart.pl](http://www.em-smart.pl) in the Support tab



## 5. Product characteristics and application

The EM-Smart series laser markers are small and compact.

The Em-Smart Laser can mark almost all metals:

- gold
- silver
- copper
- iron
- aluminum
- stainless steel
- titanium
- e.t.c.

Plastics:

- ABS
- PP
- e.t.c.

Other materials:

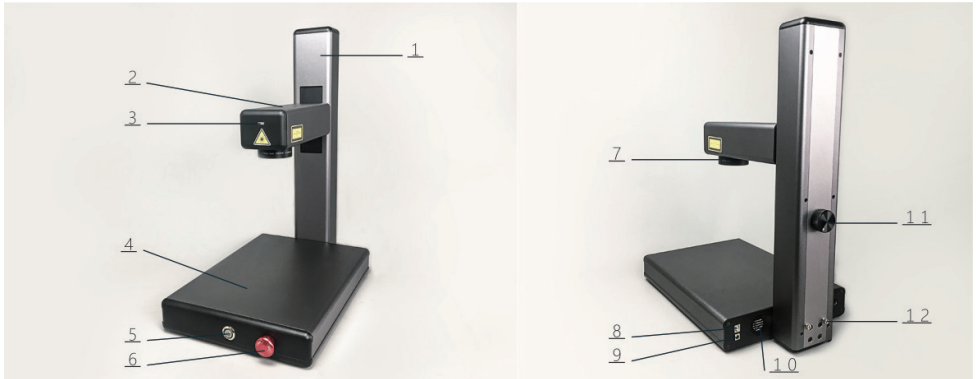
- leather
- rock
- veneer

## 6. Principle of operation

The machine sends a laser beam with a wavelength of 1064nm, the ray of which is transferred through lenses to the product placed on the machine's work table. The lenses move in the x and y axes, thanks to which the engraving on the materials is carried out one by one micro-dot. The process of setting the power and engraving speed is set using the Ez-Cad program installed on the computer. The software itself works only on the operating systems of the Microsoft brand.



## 7. Machine description



1. Support arm;
2. Path of light;
3. Machine operation indicator (when the light is blue, it means the machine is working);
4. Working field;
5. Main machine switch;
6. Emergency stop button;
7. A lens that focuses the laser beam on the working field;
8. Port for connecting the machine to a computer via a cable;
9. Power supply;
10. Air outlet;
11. Focus (height) adjustment knob
12. Arm positioning screws



## 8. Technical parameters

Weight	10 kg
Size	260 x 440 x 505 mm
Work Area	110 x 110 mm
Laser Power	20 W FIBER Laser
Speed	0 - 7000 mm/s
Operating system	Windows
Operating temperature	from 15 to 35 degrees Celsius
Wavelength	1064 nm
Energy Consumption	to 120 W
Maximum height of the item	100 mm

## 9. First start-up

1. Turn the emergency button clockwise and then turn on the machine with the power button;
2. Install the work table into the machine, remember to center it. (The table should be glued to the machine)
3. Connect the machine to the computer with a cable, then remove the lens cover and run the software. (You can find the software installation guide at [www.em-smart.pl](http://www.em-smart.pl) in the Support tab)
4. Place the item you want to engrave on the work table.
5. In the software, click Red (F1) and two red laser dots will appear on the machine
6. Using the knob on the back of the machine, set the focus (height) so that the two spots merge into one. Then click OK
7. Import the graphic into the software, fill it in by clicking the letter „H” from the taskbar, and then set the marking parameters or use the default parameters when continuously selecting the graphic.
8. After setting the parameters with the graphic selected, click Red (F1). The machine will show a selected field of your project. To change the position of the graphic on the work area, use the arrow keys on the keyboard (up, down, left, right). When finished, click OK
9. Once you have positioned your graphic exactly, click Mark (F2) to start engraving.