CompactMark

Committed to Laser Marking

member of ElEn group

Laser Marking has never been so easy

Laser marking offers a fast and accurate means to mark and engrave on a multitude of substrates including a wide variety of ferrous and non-ferrous metals (coated and polished), plastics and numerous organic materials. Any combination of symbols, logos and characters can be marked accurately providing a permanent mark which is environmentally friendly.

The laser marking process provides a fast and accurate means to mark with great versatility for different types of applications. This non contact, sterile process requires no mechanical support for applications such as micro-machining and small parts marking.

Laser marking is used for many applications such as product identification and verification, logos, graphics, traceability, serialization, date codes, lot codes, part numbers, schematics, expiration dates, data matrix and barcodes. The depth of the marking can vary from a surface mark, to simple paint removal and ablation to deep engraving. Marks can be made on flat and cylindrical surfaces, as well as parts with varying heights and shapes. The laser can mark directly on the part with multiple lines of alpha-numeric characters, text and logos, as well as completely around a 360 degree circumference.

Laser parameters can be adjusted to mark a full range of materials hard, soft, highly reflective, coated, polished, small (size of eyeglass screw) to very large such as airplane wings and oil pipes.

Some common applications include marking on cutting tools and drill bits, radio backlit buttons, surgical instruments, medical screws and implants, cell phones, bearings, knives and cutlery, guns and ammunitions, automotive, military and aerospace parts.

Complete and Versatile

The CompactMark is the result of many years of research and development in laser marking technology. This Class I rugged industrial system is a welded steel construction. The basic configuration comes with X, Y and Z positioning axis. It offers versatility and increased productivity with optional standard automation.

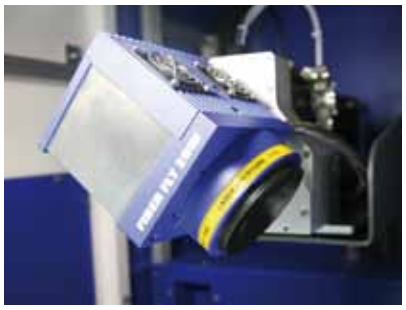
The choice of moving the laser in the X and Z axes and the table in the Y axis, has allowed for a system which is just 810mm wide to mark parts up to 470mm high with a working area of 580x400mm. The work area can be used to mark single parts, arrays of parts, or complete trays or pallets consisting of a multitude of different parts.

The standard system offers many optional features which allow advanced automation. Inside the enclosure you can add many features which provide automation for increased throughput. Features include a C axis to mark around cylindrical parts, a 5th axis (Theta) that allows the rotation of the scanning head around the object, to mark less accessible parts or to mark up to 140 degrees around trays of cylindrical parts such as drill bits. Other standard automation items include a palletized pick and place unit, tag marker with multiple magazines, conveyors and robots.

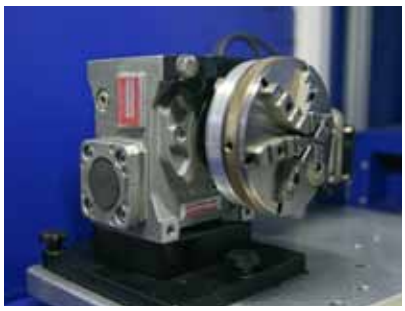
The CompactMark is available in 3 different versions: Standard, Large and Extra with respective axis strokes of 460, 760 and 1160mm.

The machine can be built to meet any specific requirements you may have. Any of these features together with customized automation can be added at the time of purchase or during future upgrades.

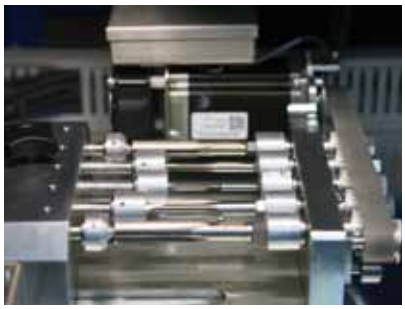
The CompactMark has a small footprint for lean manufacturing and can be adapted to any working environment as well as integrated into factory production lines.



Motorized Rotating Head (Theta axis)

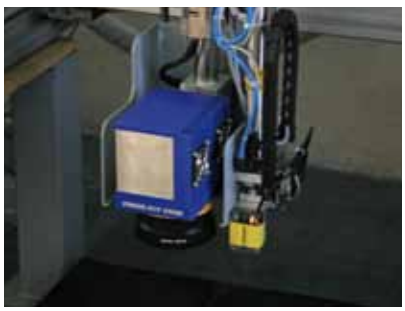


C axis to mark on cylindrical parts



Multiple C axes (up to 10 spindles) with pneumatic operation

Selection of the program to be marked using a Bar Code Reader



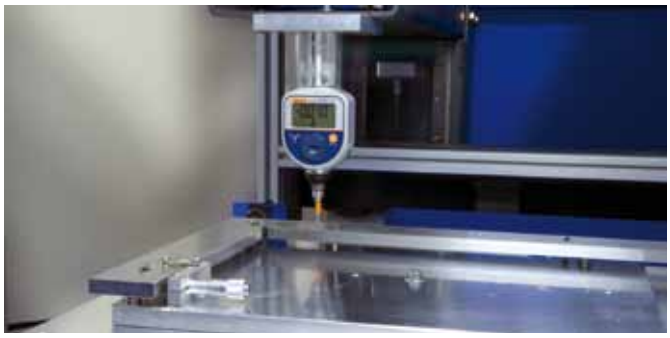
Integrated System for reading and verification of DataMatrix codes

Precise, Rugged and Safe

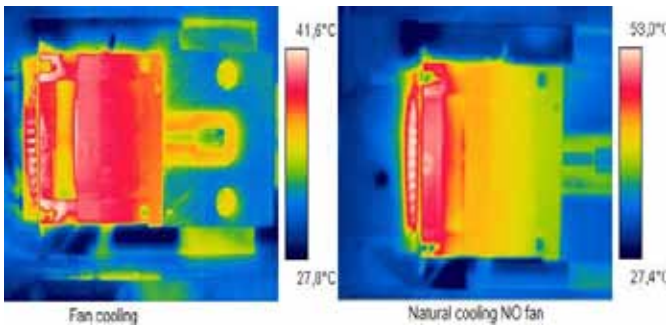
The CompactMark is a solid and versatile machine that provides the highest quality of reliable marking and is designed and built to last.
By combining only the finest materials and components with years of research and development, Lasit guarantees customers a superior and reliable state-of-the-art laser marking system.

RIGIDITY The CompactMark is entirely constructed of a welded steel structure which provides high speed marking together with optional automation. It is engineered and designed with technology that allows the processing of micro-marking on very small parts as well as marking on large surface areas. This technology provides accurate and repeatable positioning in both cases. The guides, the high-precision screws, and the encoder motors (2048 steps/turn) ensure consistent and precise results.

STRICT TESTS In addition to choosing only the highest quality materials in the design and construction, each unit of the CompactMark is thoroughly tested throughout the production process. Moreover, before delivery the CompactMark is subjected to strict final testing to guarantee required quality assurance standards. Optimal performance for customers is thus assured.



THERMAL ANALYSIS The machine is designed for long life to guarantee high quality and consistent marking which allows for 24/7 production. Rugged tests were developed to analyze and study the thermal behaviour of the CompactMark's metal structure and the thermal behaviour of the motors. Through these tests, the performance of the axis motors was improved 43% by reducing motion and movements thus optimizing the positioning accuracy.

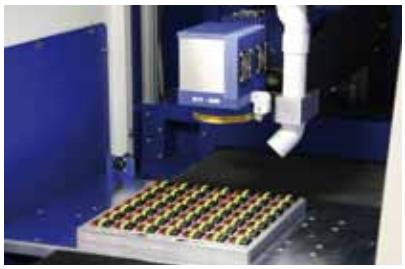


VIRTUALLY MAINTENANCE-FREE The CompactMark is a completely modular system. The laser, motors, scanning head and PC are all easily accessible and connected using few cables with simple connectors.
With the support of our customer care telephone support service, troubleshooting is immediately available without the need for on site specialized technicians and costly service calls. This means almost zero down time as well as the elimination of most maintenance and assistance costs.

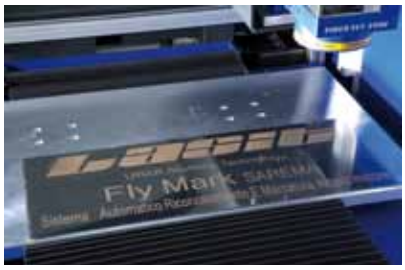
Productive and Flexible

The CompactMark is designed both for companies that need to personalize or make unique their products – and need to mark a variety of different low volume parts – and for those specialized in high volume production.

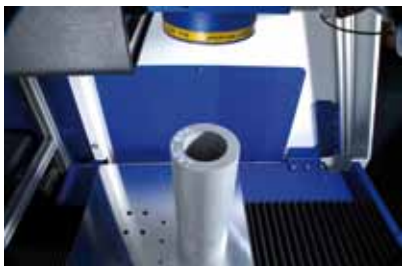
MARKING ON PALLET To increase overall production it is possible to automatically mark series of parts on a pallet, occupying all the working area. FlyCad software provides programmable operation of the laser, once the data such as the number of pieces to mark, X and Y coordinate movements and the marking requirements are entered in the FlyCad Software, all the marking process is controlled automatically. By using a hybrid steel structure design, the Lasit XY axis are faster, with both increased acceleration and velocity, and more accurate than traditional X-Y tables offering a closed cycle with encoder provided motors. Vibration is virtually eliminated.



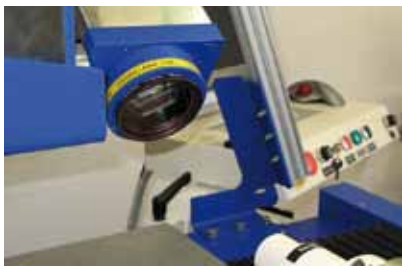
MARKING OF LARGE DRAWINGS The winning combination of the high precision X-Y axis, together with the accuracy of the scanning head and the versatility of the powerful user-friendly software provide marking for parts as large as the table itself (from 580x400mm standard design to 1180mmx400mm expanded design). Drawings can be imported or can be drawn in the FlyCad software. The software will compensate for segmentation and will provide all movements with accurate, seamless marking.



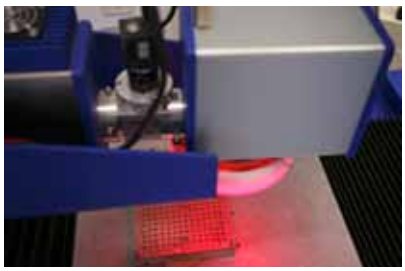
MARKING OF HIGH AND COMPLEX PARTS The Z axis allows for parts up to 470 mm high to be easily marked. The motorized Z axis with encoder is fully controlled by the PC and provides marking on multiple levels on the same part without the need to continually reposition the part. This saves considerable time and avoids errors in repositioning parts or having to set up multiple programs for one part. By using the FlyCad marking software, it is possible to create and save programs complete with the axis movements and other machine functions.



MARKING ON CYLINDERS AND CONES Marking cylindrical parts or curved surfaces is now a simple process. With the C axis the operator can mark around the cylindrical part without the necessity of manually repositioning. It's possible to completely and automatically mark straight, helical, multiple lines on different diameters. Since the scanning head can rotate, the marking of conical elements is made simple. In FlyCad there is a function to compensate for conical marking without tilting the parts and avoiding the use of expensive and difficult fixturing.

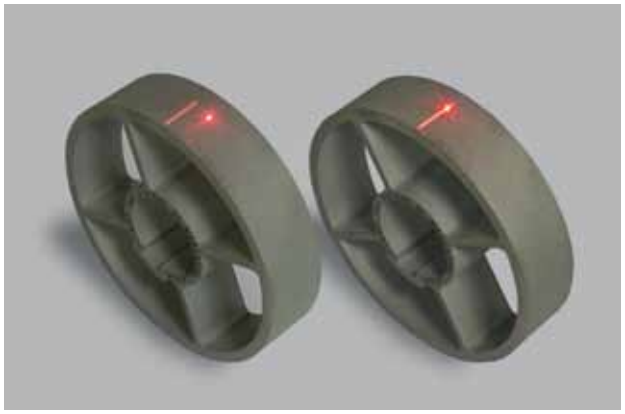


VISION SYSTEM The vision system, either external to the lens or integrated, provides accurate positioning when extremely precise centering is required. This provides automatic programmable marking of any geometry on any location on the part. In combination with the Pattern Recognition Software it's possible to automatically center the marking – also on parts randomly placed or oriented in the machine. FlyCad software fully supports the Vision System functionality showing – in real time – the image of the marking area with a x10 magnification.

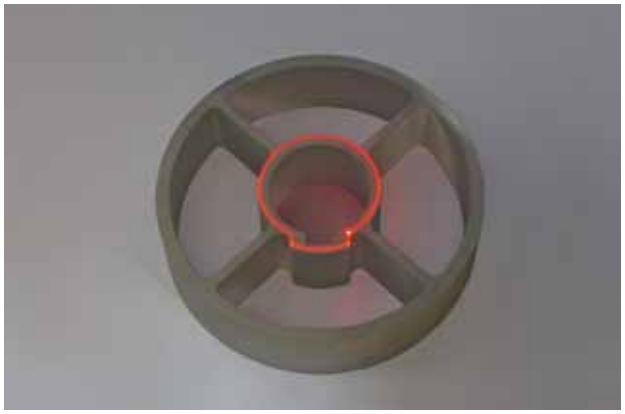


Secure and Ergonomic

The CompactMark is a high quality, Class I marking centre with a perfect combination of flexibility and integrated automation. With standard features such as the X and Z Axis, the Y Table, along with available options such as the rotary C axis, the rotating spindle feature, the rotating scan head, palletized pick and place, the tag maker, robots and conveyors, the CompactMark workstation is a virtual factory production centre with compact footprint unlike other existing technologies.
In the design phase of the CompactMark, customer feedback and suggestions combined with our own research and development, resulted in a high performance, ergonomic laser marking system capable of multiple functions all in the same machine.
With the CompactMark, the operator can work standing or seated by merely adjusting the height of the working plane using an electronic command. The system was designed for complete height adjustment regardless of the operator height.
The system is designed to meet all European and US standards, complying with all safety, ergonomic and mechanical standards to ensure optimal performance.
Safety interlocked pneumatic doors which are opened and closed by merely touching the two optical switches without any mechanical interaction. The use of an optical touch system rather than traditional buttons reduces the weariness and stress of the operator, increasing overall productivity of the operator and machine.
Safety requirements provide immediate opening of the door if either of the switches are released. This is designed to prevent any accidents that may occur while laser and mechanical features are operating.
The ergonomic computer console is very comfortable for the operator to use. The console incorporates an industrial keyboard, 19-inch LCD monitor, trackball and joystick for X-Y-Z positioning and also the machine commands.
Instant focus height is easily obtained by using the "Smart Focus" together with the joystick functionality.
The enlarged Class I inspection window, together with the internal lighting system, allows clear and secure viewing inside the marking cabinet.



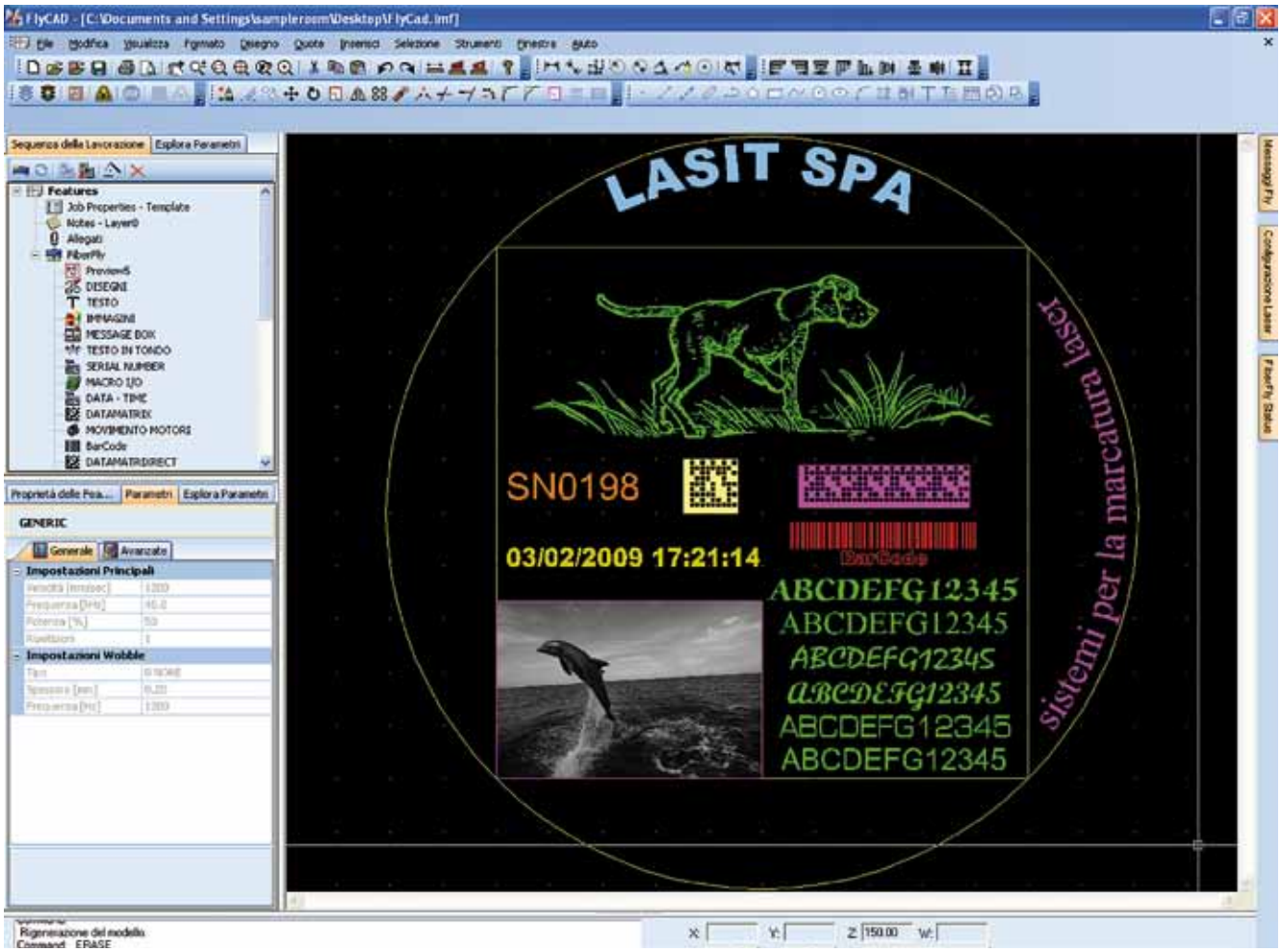
SMART FOCUS The operator is able to simply align the red light of the pointing laser (a dot and a line) to determine the correct focus height for the Z axis. The operator can also adjust the brightness of the light and the position by this process. This is much faster and more precise than earlier focusing technologies.
The focus can also be programmed automatically by merely entering the height of the object in the software and it instantly moves the Z axis to the correct focus height.



IMMEDIATE CENTERING The use of the preview function to centre the marking drawing on unique, complex or very expensive products makes the process fast and accurate. The preview function enables the showing of any image with a red laser pointer – not only the classical rectangle that circumscribes the marking object, the brightness can be adjusted in the software to adapt it to different materials. By using the joystick for moving the axes, provides easy positioning of the preview image on the part to be mark.

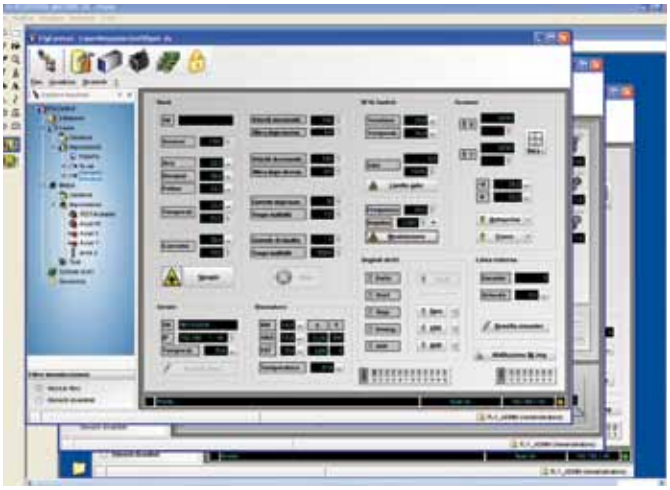
FlyCad
Complete and User Friendly

Lasit has developed its own proprietary software called **Flycad** which provides full capabilities to operate the Lasit CompactMark.
Software upgrades and enhancements are continually being added as a result of customer feedback and customization. This software also provides complete drawing capability which is characterized by a complete, intuitive graphic/drawing based interface.
The software is Windows based, providing actual Cad drawing capability with complete control of the laser operation, laser functions, and motor controls.
In addition to importing text and drawings, the operator is able to draw directly on the computer screen using FlyCad software which offers complete control of the laser and laser parameters (speed, frequency, power) as well as set up of all the machine functions (axis movement, repetitions, etc.) prior to starting the marking process.
This powerful software provides the marking of any combination of true-type text (both filled and outlined), serial numbers, dates and times, bar codes (standard or reversed), DataMatrix (square or rectangular), static and dynamic text, text tables associated with a database. This can be with round text, vertical text, vector drawings and bitmap images in grey scale or black.
In addition to the integrated handling of all axes, it is also possible with FlyCad to mark drawings bigger than the actual marking area (split plane), you can mark on both cylindrical and conical surfaces. The cylinder is broken into segments which are seamlessly marked to create one complete image.
FlyCad also provides for repeating or replaying the same function (array marking) within the same program after setting the initial X Y coordinates. It also provides for Marking on the Fly which allows the operator to mark while the material is actually in motion.



The use and maintenance of the CompactMark is made easier by **FlyContro**l, an exclusive proprietary diagnostic and operation software which monitors all of the laser functions.

FlyControl software makes possible saving directly into a Microsoft® SQL server the machine configuration.
The software can also restore the machine configuration when a computer may be replaced or substituted, monitor the status of the laser, set up parameters of all axes, and monitor the status of the I/O signals when interfacing with other systems.



FlyControl monitors critical temperatures of various components including diodes, electronics parts, aspiration areas, heat sink, radio frequency generator. It also monitors the power emitted from the diode and from the laser, the power supply tensions, and also monitors the encoder when marking on the fly.

This simplifies the laser maintenance as the laser can be operational also in manual mode (this function is password protected if required). The operator can adjust laser parameters including power and pulse frequency in manual mode as well as the automatic programmable mode.

Within FlyControl all Axes are easily controlled via programmable XY coordinates. The axis are easily positioned by simply entereing the coordinates or by the joystick movement whereby the software records the actual position. All of the values for Home, Search, Acceleration, and Speed are easily set for each axis in the FlyControl software.

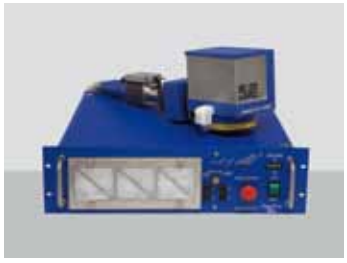
The software provides looped feedback from the encoder to monitor the position of the axes. The speed for each axis is independent from the other axis.
The specific control parameters are all password protected so that all maintenance can be secure.
When intergrating with HMI systems or other controllers 24 inputs and 24 outputs can be supported. With a few mouse clicks - and in only one screen - the operator can monitor the signal status and the activation (On/Off) and function of each I/O.

FlyControl also regulates access use when there are multiple users of the machine. It is possible to create several user profiles and assign different levels of operation including supervisor, administrator or operator use.

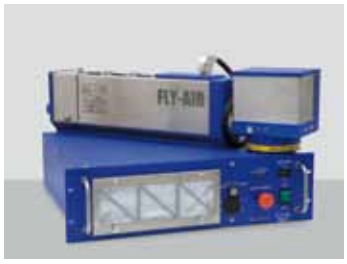
FlyCad can be customized to specific customer requirements very easily.
The OCX controls can be used in C#, VB, and Dot NET to allow easy interface with other applications. Software can be written or modified in collaboration with Lasit to meet specific requirements in a safe and secure mode.
It is possible to import data or load working programs directly from a database supplied from the customer. The software has the capability of entering data via a bar code reader or 2D Matrix reader. A custom interface can be supplied with specific functions for a more user friendly interface. The Lasit worldwide web site www.lasit.it provides a free, up to date download of software updates.

Types of lasers

λ = 1 µm Fiber, YAG, Yvo4 for marking all kinds of metals and a great variety of plastics



FiberFly - Available Power Output: 10, 20, 30, 50 and 100W.
Laser generates pulses with a frequency range from 1Khz to 500Khz.
Laser is capable of surface marking or deep marking. The quality of the beam (M2) and the ability to adjust the pulse width provides for high resolution, high quality marks from very fine to very wide characters. Deep engraving as well as marking on large areas is possible.
10, 20, 30, 50 W - all Air Cooled. 100 W - Water Cooled.



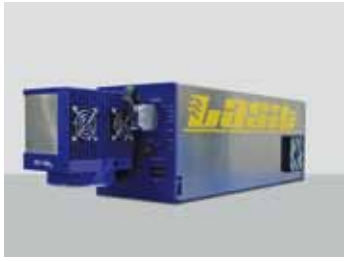
FlyAir - Available Power Output: 5, 10, 20, 30W.
Uses a YVO4 (vanadate) crystal and generates pulses from 1 kHz up to 200 kHz.
High quality laser beam with short pulses makes this an ideal laser for marking on plastic materials or metals with high reflectivity requiring surface marks with high contrast.
Air cooled.

FlyDPPS - Available Power Output: 20, 30, 50, 70, 100W.
Uses a YAG crystal and generates pulses with a range of frequency from 1 kHz up to 20 kHz.
Ideal for all applications in which – to achieve a black marking with high contrast (annealing) – it is required a high power with a medium spot size, without any hot spots and deformation of substrates.
Closed Circuit Water Cooling

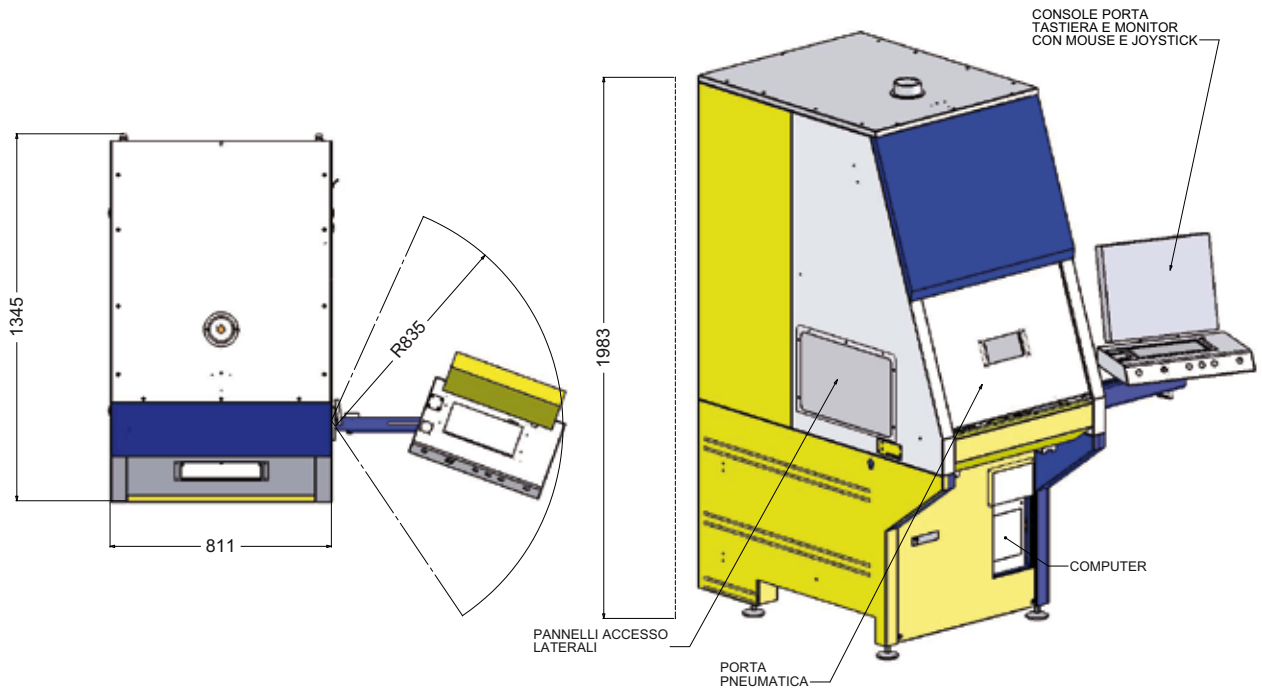
λ = 0,532 µm for marking thin metals and special plastics

FlyAir Green - Available Power Output: 2, 3, 6W.
Laser generates a very pure green light. Ideal for marking on gold and special plastics not otherwise marked with enough contrast.
532µm wave length – provides marking without any deformation on very thin substrates or plastics. No "burning affect" eliminates any damage to the material.
Air cooled.

λ = 10,600 µm RF C02 for marking various plastics, anodized aluminium, many natural and organic materials, acrylic, glass, leather, paper, wood, marble, granite, and stone



FlyCO2 - Available Output Power: 10, 30, 80, 100W.
An RF excited Sealed C02 laser. Continuous (CW) or pulsed mode
Combined excellent beam quality with peak power capability provides for many applications including: marking glass without chipping it or cutting very thin grooves without burning substrate.
Air cooled.



	Standard	Large	Extra
Table Dimensions (mm)	690x400	890x400	1290x400
Marking Area (mm)	580x400	780x400	1180x400
Max workpiece Height (mm)	470 (FFL100) 413 (FFL163)		
Max workpiece Weight	120 kg		
Door Dimensions (mm)	690x480	890x480	1100x480
Safety Inspection Glass (mm)	200 x 300 (1x)	200 x 300 (2x)	200 x 300 (3x)
Removable Side Panel (mm)	490 x 300 (2x)		
Door Command	Optical Switches		

Axis X Stroke (mm)	460	760	1160
Axis Y Stroke (mm)	400		
Axis Z Stroke (mm)	480		
X axis Speed (mm/s)	500		
Y axis Speed (mm/s)	500		
Z axis Speed (mm/s)	50		
W axis Speed (°/s)	360		

Power Connection	230 Vca, N+Ph+Ground 50/60Hz, 10A
Max Power Consumption	1800 VA
Pneumatic	Compressed air 4-6 Bar ø8 pipe connection
Laser Safety Class	Laser Safety Class I according to EN 60825-1

Console	Emergency Stop - Class I/IV - Start/Stop - Trackball - Keyboard – LCD monitor Joystick for XYZ axes control	
Vacuum extraction System with active carbon filter	Optional – separated	Optional – integrated
Laser and electronics conditioning	Optional	
Height of the working plane electronically controlled	Optional	Not possible

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