

Laser Marking for Automotive Industry





Traceability plays a fundamental role in global industry

Traceability is one of the key demands of today's market. Keeping one's production chain under control is nowadays a requirement for all companies in the fast-growing industrial sector.

Thanks to laser technology, it is possible to mark barcodes, QR-code, Datamatrix and texts clearly and permanently on any type of component, and automotive companies are increasingly driven to implement traceability methods to increase vehicle safety and traceability.

The content of the marking always uniquely identifies the piece and can also be composed of serial numbers and indications relating to the lot and the date of production. In this way, it is possible to retrieve information relating to the production chain of the piece at any time.



BARCODE



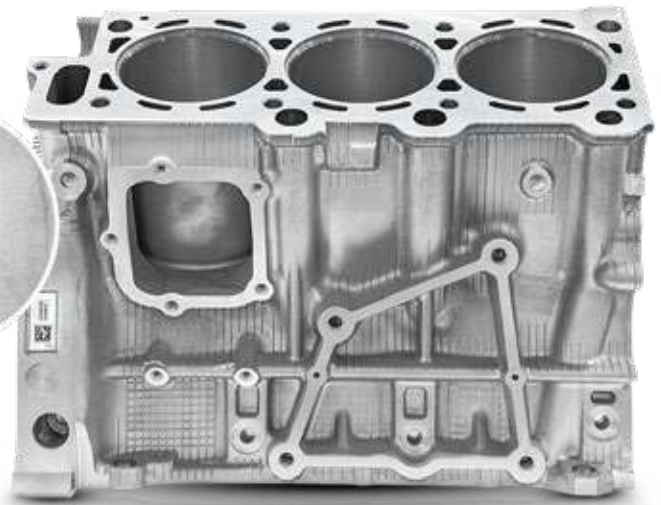
QR CODE



DATAMATRIX



ALPHANUMERIC CODE



Much more than a laser marker

LASIT laser solutions are not limited to the production of standard machines, which must necessarily be adapted through other systems and finally be integrated into the customer's production chain.

The service we offer is fully verticalized.

This applies both to Hardware and Software, where great specialization and thirty years of experience have enabled us to find innovative "turnkey" solutions that are suitable for Industry 4.0. It is therefore not necessary to divide projects and entrust them to different manufacturers to manage component handling, marking and verification.

This represents an enormous advantage for all our customers and our partners, who are constantly assisted by a specialized team, who will follow their project through every stage and all future implementation.

RotoMark X



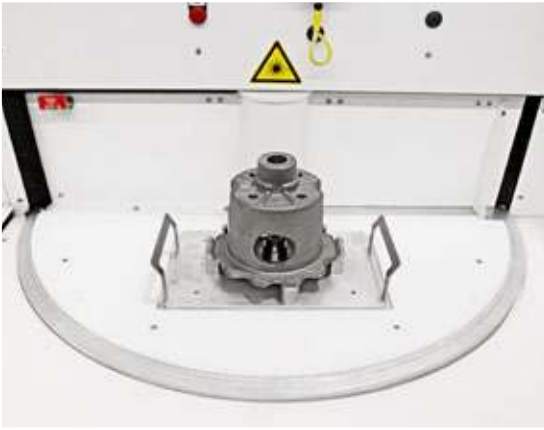
Laser marking of bevel gears and differentials during machining

About 3 years ago, LASIT accepted a new challenge: design and implement a marker to track bevel gears and differentials of automobiles, while meeting precision criteria, with 24-hour processing at temperatures above average and high productivity, which therefore translates into reduced cycle times and the possibility of verifying the quality of the marked DataMatrix codes.

We therefore designed and built the Rotomark X, a steel structure marker, a cabin equipped with X and Z axes and a rotary table with an inspection system and two Datamatrix readers.



To minimize the risk of human error during operations, we have adopted two solutions: the first is a reader that checks that the loaded template is exactly the one required by the factory system, the second is an inspection system that ensures that the loaded piece is the right one.



When the component is loaded from the external side of the machine, the stability of the internal side - where the laser is present - is secured thanks to the pneumatic clamps, which block the table.

Both the axes and marking during machining are essential for increased marker productivity, while obviously the quality verification system with the camera equipped with a second reader also contributes to this.

At the end of the marking process, the value of the final result is communicated with an output lamp and a signal on the display: in this way, the operator is able to immediately recognize any production waste and analyze the performance of the machine over time.

Working position	Stand Up
Working table size	Ø1000 x 15mm
Maximum marking area	850x220mm with FFL254
Maximum weight on the table	20Kg on a circumference of ø110 on a ray of 240mm
Maximum marking height	Marking area Ø220 Manual mode (side door) 300mm Automatic mode 240mm
X axis stroke	630mm
Z axis stroke	300mm
XZ axes speed	X up to 500mms/s Z up to 15 mm/s

Bulkhead height	260mm
Laser source	Ytterbium doped fiber laser
Laser power	20-30-50 W
Laser pointer for preview	With red light Class I (safe)
Machine size	Height 2005mm Width 1778mm Depth 1684mm
PC, Monitor & Software	Included, provided by LASIT
Motors type	Max. 3 with encoder
Power supply	400Vca ±10% 50/60Hz <1500VA depending on the configuration

RotoMark X

Machine Details



Laser Marking Sample Report

DATAMATRIX CODE ON CAST IRON



Laser Model	FiberFly 50W
Focal Lense	FFL160
Marking Area	Ø140mm
PARAMETERS ▼	
Time	7.8 sec.
Speed	200mm/sec.
Frequency	50kHz
Power	90%
Repetitions	1

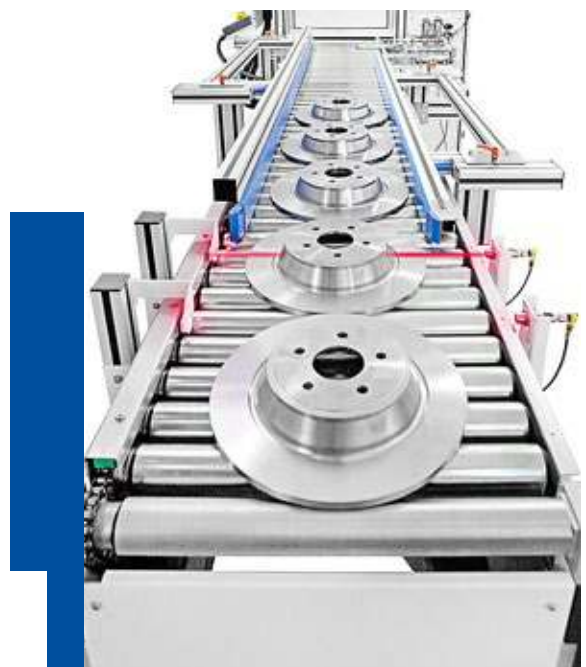


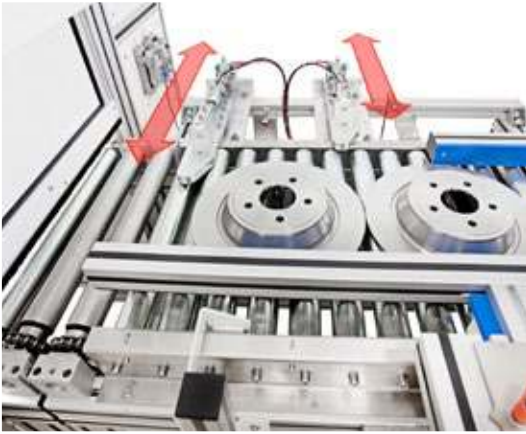
Laser Marking on Brake Discs

About four years ago, one of the world leaders in the production of brake discs in the Automotive sector asked Lasit for a laser marker that could be integrated into a massive production chain and work with robots. Hence the first FlyRoller for laser marking of DataMatrix codes was created, customized to meet the required efficiency and reliability criteria.

The machine is composed of a marking cabin and a motorized roller conveyor with two independent flows, with end stops that can be adjusted via the software. The cabin is equipped with Y and Z axes and the machine works with two robots: one that loads the incoming disc and the other that picks it up at output after marking and verification. Another key strength of this marker, which is worth emphasizing, is the customized software that interfaces with the customer's database.

The Y and Z axes are equipped with servomotors with encoder and they have an effective travel, respectively, of 448mm and 180mm: this flexibility makes it possible for us to mark discs of different sizes.



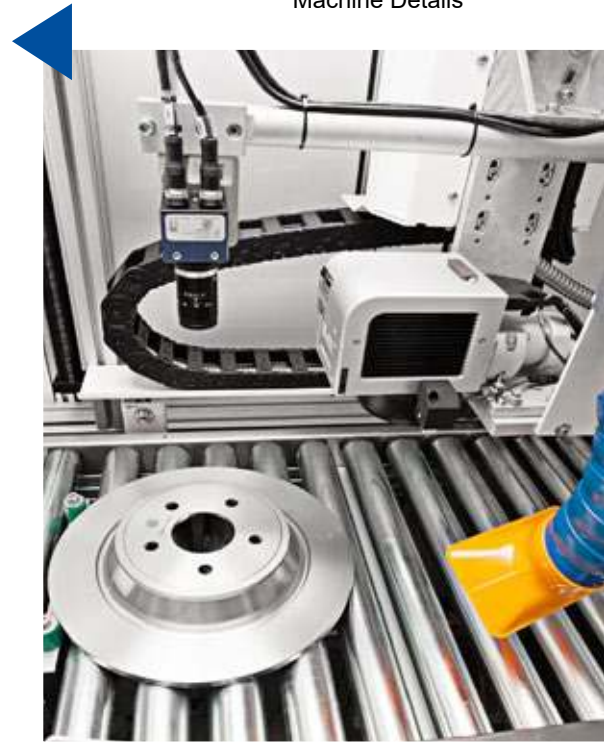


The entry of the components in the cabin is regulated by a buffer, which allows the robot to queue the pieces, which will then be separated automatically and inserted one at a time. Once it has entered into the cabin, the disc is identified by the inspection system, marking is redirected through the software without the need to reposition the laser head mechanically, the piece is marked, moved to the external roller conveyor and subjected to another Data Matrix inspection. At this point the cycle is almost completed and the re-orientation and lifting of the component facilitate its grip by the robot, while marking of a new disc has already begun in the cabin.

All machine safety is managed in PROFIsafe to communicate directly with the safety net of the existing system and to avoid the laying of additional cables.

Working position	Stand Up / Robot	Conveyor width	500mm
Brake discs size	Ømin 200mm Ømax 500mm	Laser type	Ytterbium doped fiber laser
Maximum marking area	400x100mm / FFL 160	Laser power	20-30-50-100 W
Conveyors speed	300mm/s	Laser pointer for preview	With red light Class I (safe)
Conveyors length	total length 3100 mm	Machine size	Height 2300mm Width 6578mm Depth 1525mm
Maximum marking height	300mm	PC, Monitor & Software	Included, provided by LASIT
X axis stroke	300mm	Motors type	Max. 3 with encoder
Z axis stroke	300mm	Power supply	230Vca ±10% 50/60Hz <2000VA depends on configuration

Fly Roller Machine Details



Laser Marking Sample Report

DATAMATRIX CODE ON RAW METAL



Laser Model	FiberFly 50W
Focal Lens	FFL160
Marking Area	Ø140mm
PARAMETERS ▼	
Time	11.2 sec.
Speed	200mm/sec.
Frequency	50kHz
Power	90%
Repetitions	1 + Clean



Laser marking during machining on Die castings

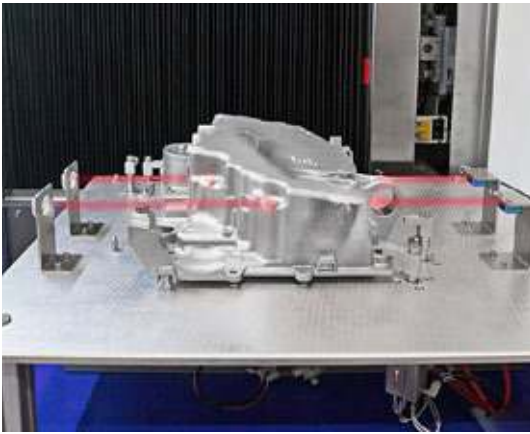
A few years ago, a German company contacted Lasit to create a complete laser system for marking Datamatrix codes and text strings on die castings.

The company, which produces Automotive components, requested a complete, high-productivity system that was able to work with robots and verify quality after code marking. The FlySwap was therefore designed according to these specific requirements and is a marker with a Fiber laser technology, equipped with XYZ axes.

To mask the robot loading time and increase machine productivity, the latter was equipped with a double loading station. In this way, while marking is in progress on one station, the robot can load the next piece in the free station. These operations are facilitated by the upper pneumatic door, which frees the work area from obstructions so that the robot can position large pieces on the template without any difficulty.

This marker is equipped with an inspection system that is able to perform auto-centering of the pieces to prevent any positioning errors by the robot. The two stations are equipped with sensor that allow the software to recognize the piece and automatically load the correct marking layout.





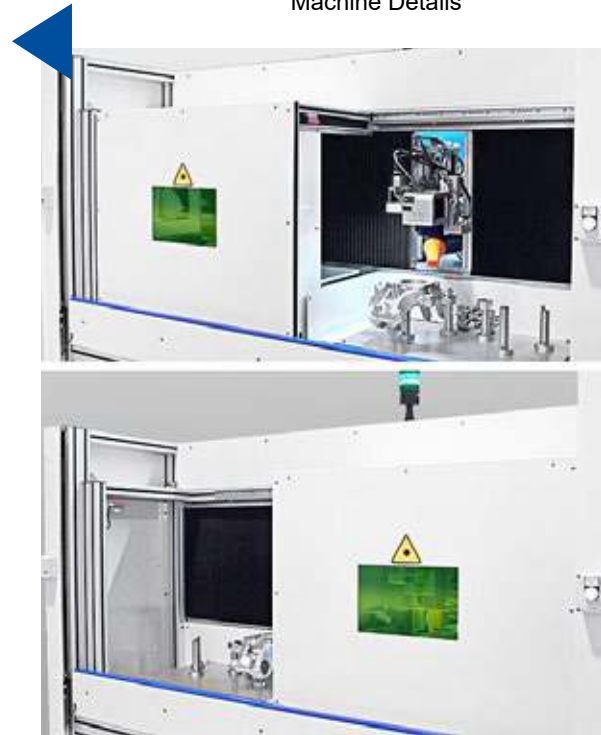
Another distance sensor automatically focuses so as to manage the height variations of the pieces due to the limits of die-cast printing.

The laser head has a rotation greater than $\pm 100^\circ$: this, together with the internal Cartesian axis system, allows us to reach and mark any position in the work area.

Once the laser marking process is completed, the camera checks and performs grading of the marked Datamatrix, the cabin and the head move to the other station and the cycle can start again. Before concluding, it is worth focusing on the automation potential of this machine, which can easily be placed in a robotic cell.

Working position	Stand Up / Robot	Speed	X and Y up to 150 mm/s Z up to 50 mm/s
Working table size	800x450x20mm hard anodized with depth of 30 μ m - Step drilled matrix 50x50mm \varnothing 8H7/M6	Door type	Pneumatic
Maximum marking area	700x500mm / FFL 140 750x550mm / FFL 220	Laser type	Ytterbium doped fiber laser
Total weight	620 kg	Laser power	20-30-50-100 W
Max. weight on plane	200 kg	Laser pointer for preview	With red light Class I (safe)
Maximum marking height	90mm / FFL 140 80mm / FFL 220	Machine size	Height 2150mm Width 1950mm Depth 1250mm
X and Y axes strokes	X 1245mm - Y 105mm	PC, Monitor & Software	Included, provided by LASIT
Z axis stroke	90mm	Motors type	Max.2 with encoder
		Power supply	230Vca \pm 10% 50/60Hz <2000VA

FlySwap Machine Details



Laser Marking Sample Report

DATAMATRIX CODE ON DIE CASTING



Laser Model	FiberFly 30W
Focal Lense	FFL160
Marking Area	\varnothing 140mm
PARAMETERS ▼	
Time	12.2 sec.
Speed	150mm/sec.
Frequency	30kHz
Power	90%
Repetitions	1 + Clean

Tower Shuttle



Laser Marker for Differentials with Loading shuttle

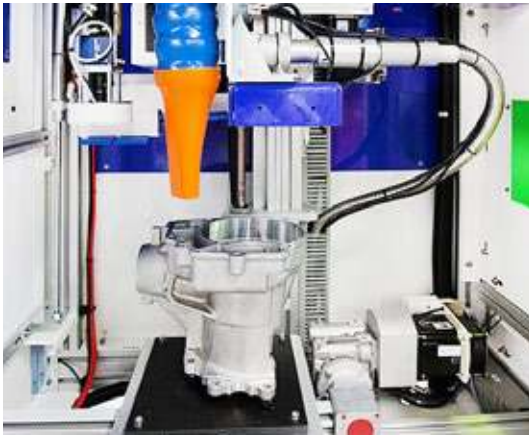
Two years ago, a large Swedish Automotive component manufacturer involved Lasit in a business automation project, requiring a system to laser mark a DataMatrix code on differential boxes, integrating the laser marker in a robot cell.

That is how our first Tower Shuttle came to be: a customized laser marker equipped with YZ axes, a 20Watt fiber optic laser designed for integration with robots.

The key strength of this marker is its motorized slide, which allows the robot to load the piece from above. This not only makes the operation convenient and fast, but also ensures the safety of the entire system, preventing any damage due to side obstructions.



When the robot arm positions the differential box on the corresponding template, the external piece presence sensors detect it and the motorized system with integrated encoder lets the slide move with extreme precision.



An inspection system inside the cabin positioned next to the scanning head frames the box of the differential, verifies its position and centers the marking automatically without any mechanical movement of the laser head.

To ensure constant control over the production chain, each box houses holes whose position depends on the CNC that produced the piece itself. This information detected by the inspection system is sent to the factory system, which produces the content of the Datamatrix that must be marked as output.

At the end, the grading and the code read by the integrated reading system are stored in the customer database to guarantee the traceability of each product. Tower Shuttle safety is managed entirely in ProfiSAFE.

Working position	In piedi / Robot	Door type	Pneumatic
Working table size	270x270mm in hard anodized alluminum	Laser type	Ytterbium doped fiber laser
Maximum marking area	Ø140mm with FFL160 Ø220mm with FFL220	Laser power	20-30-50-100 W
Access door size	560x350mm	Laser pointer for preview	With red light Class I (safe)
Max. weight on plane	10 kg	Machine size	Height 2180mm Width 1500mm Depth 785mm
Maximum marking height	200mm with FFL160 95mm with FFL254	PC, Monitor & Software	Included, provided by LASIT
Z axis stroke	450mm	Motors type	Max. 2 with encoder
Speed	Z up to 50nm/s	Power supply	230Vca ±10% 50/60Hz <2000VA

Tower Shuttle

Machine Details

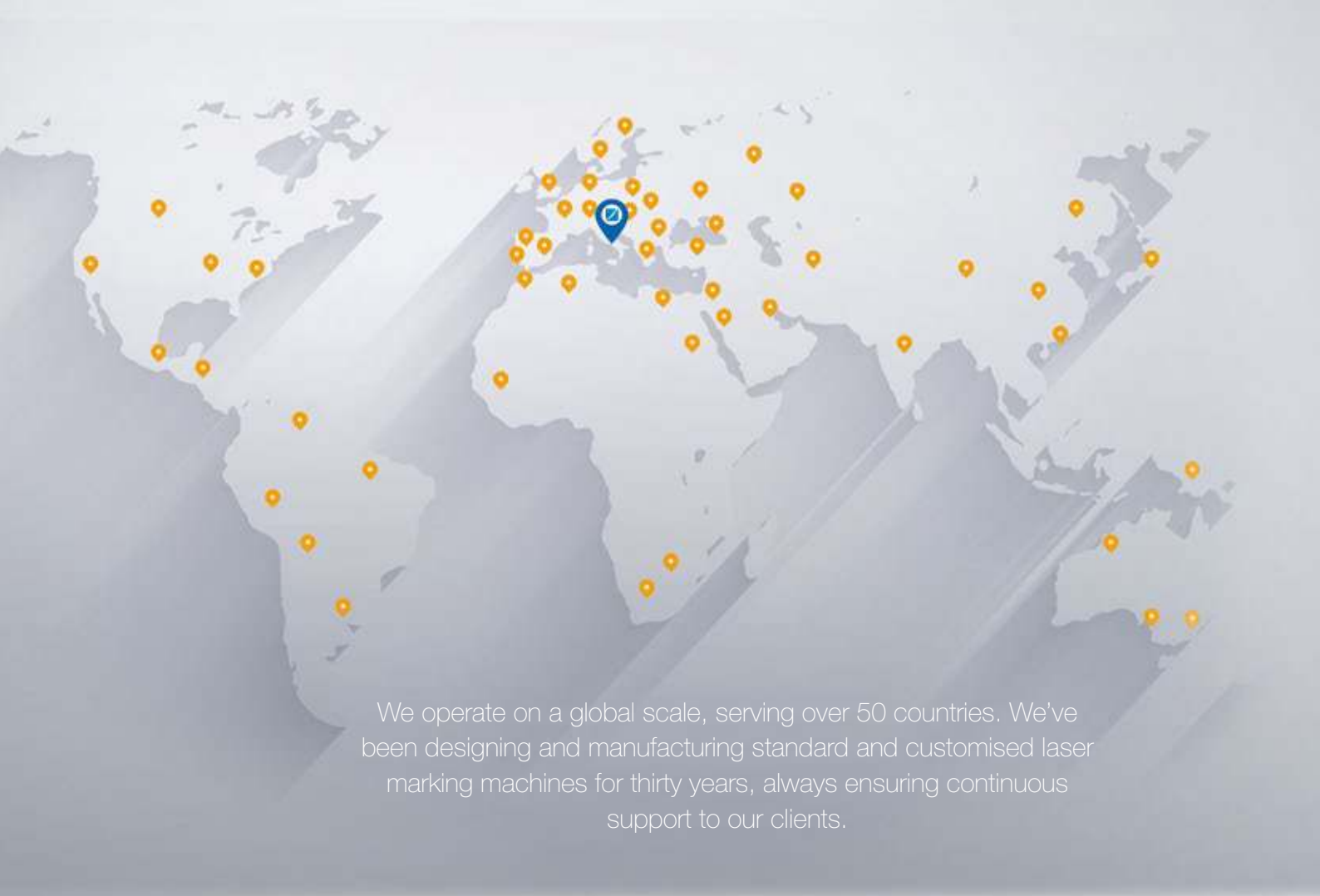


Laser Marking Sample Report

DATAMATRIX CODE ON DIE CASTING



Laser Model	FiberFly 50W
Focal Lense	FFL160
Marking Area	Ø140mm
PARAMETERS ▼	
Time	11.2 sec.
Speed	200mm/sec.
Frequency	50kHz
Power	90%
Repetitions	1 + Clean



We operate on a global scale, serving over 50 countries. We've been designing and manufacturing standard and customised laser marking machines for thirty years, always ensuring continuous support to our clients.

LASIT provides the following benefits

- ▶ Over 30 years of experience in this industry. We have seized all the challenges of the marking industry – from manufacturing laser marking heads to whole turnkey systems – providing standard and customised solutions.
- ▶ We take care of the entire project, developing the marking machine, as well as its design and manufacture, without relying on intermediaries.
- ▶ Our laser marking machines can be integrated into MES – ERP systems or simple management programs, communication software and hardware.
- ▶ Our laser systems can interface with communication protocols, such as PROFIBUS, PROFINET, and In case of integrations, the laser marking unit interfaces with an existing PLC system or a PLC system specifically programmed for this purpose.



www.lasitlaser.com

