SIGMA LASER
SYSTEMS & APPLICATIONS

Laser welding systems

for industrial applications

Innovation and precision for tool- and mold-making industry

About us

Our company

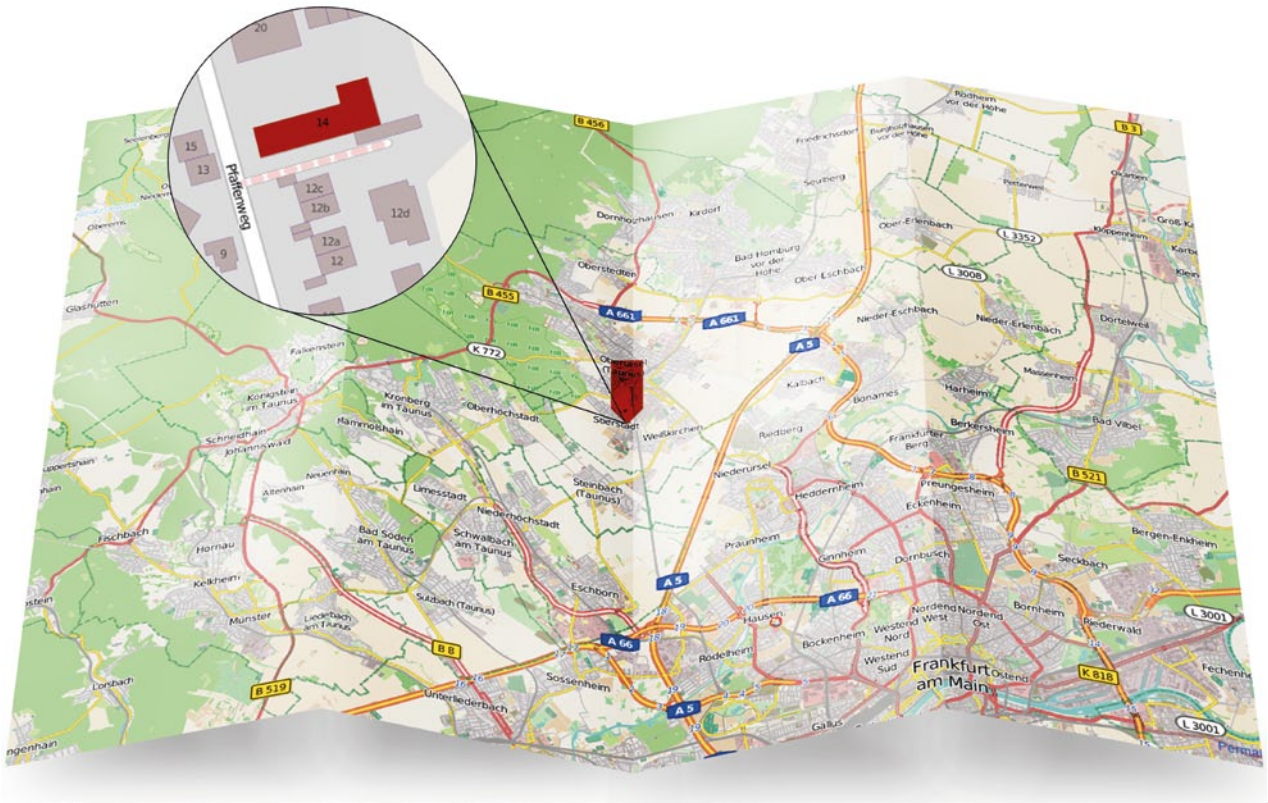
SIGMA Laser GmbH was founded in 2005 for the development of modular laser systems.

Since then our focus has been on the design of welding systems for the tool-making industry, for repair welding applications, as well as for the medical technology sector.

You can see a small assortment of references at the bottom of this page.

Our core competence is the development of highly modular solutions, making one system able to be used in a broad range of applications.

We pursue an approach towards a long-term, comprehensive consulting service in order to come up with custom-made, individual solutions for our customers.



An excerpt of our references

SIEMENS

Nolato

DIEHL
Aerospace

OPEL
Wir leben Autos.

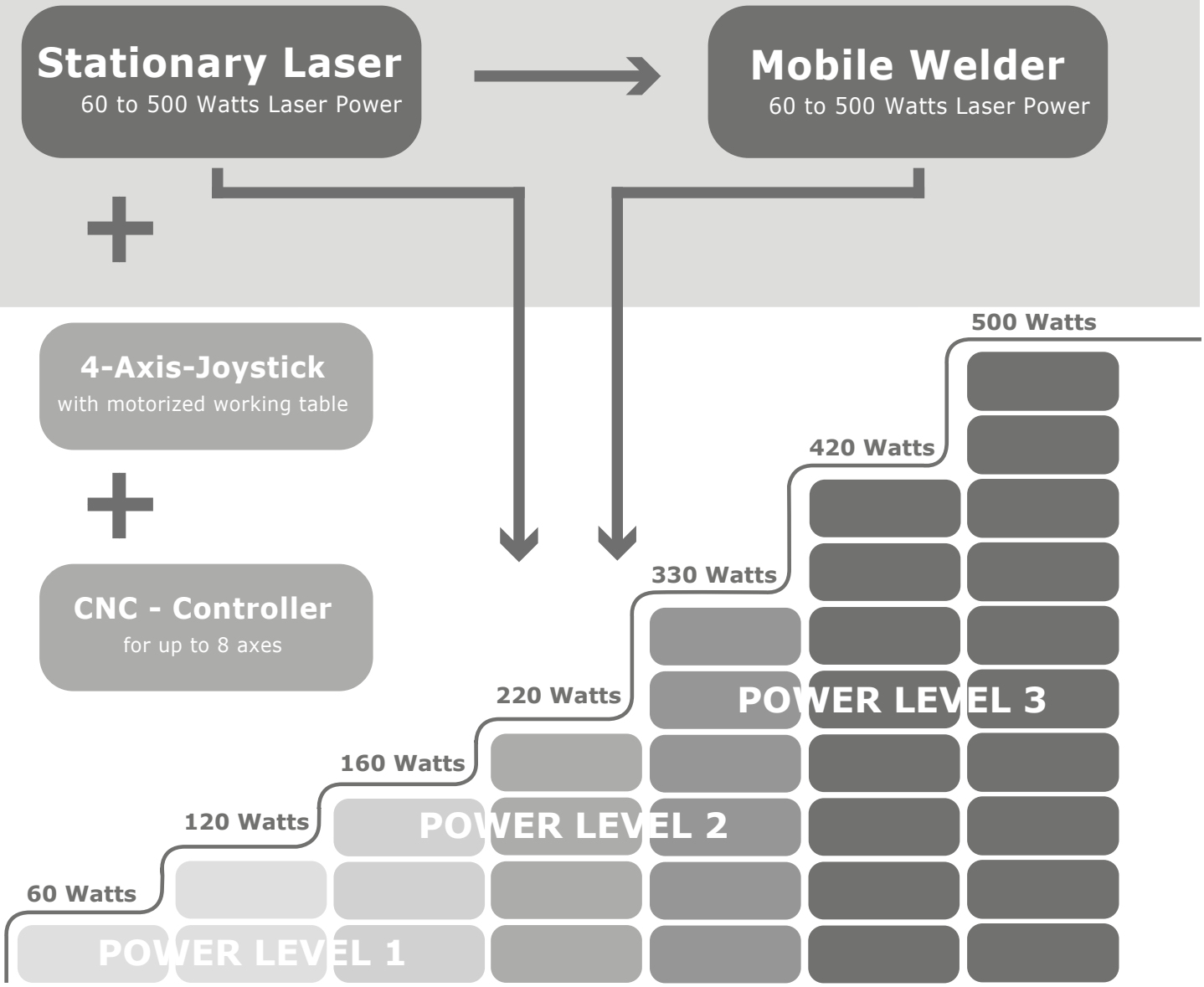
gruner

Continental
TEVES

NOVAPAX

The modular concept

Upgradeable with increasing requirements



The key feature of our high-performance laser-welding systems is their modular design so that every device can be adapted to the specific requirements of the customer. The modular concept enables the systems to be used in a flexible manner for a broad range of applications. It also simplifies maintenance.
Additionally, we offer special solutions for enhanced accessibility, automation and increase of power. Overview of options:

- Stationary Laser: The stationary device for tools up to 250 kilograms
- Mobile Welder: The flexible system with long travel
- Upgradeable: Laser power can be upgraded up to 500 Watts at any time
- Multifunctional Joystick: Full control over the four axes of the motorized working table - analog and digital
- CNC - Controller: Network-compatible for up to eight axes, with precise Teach-in-Function and 4 GB of memory

Stationary Laser

Laser power
up to 500 Watts

Modular, Ergonomic, Compact

Our laser systems are designed to satisfy the specific requirements of the tool- and mold-making but also the medical industry.
The compact and reliable stationary laser system is designed for the repairing of tools weighting up to 250 kg.
The open construction is a design feature that ensures high economic efficiency for the user during continuous operations and ease of handling.
The modular construction principle permits the unit to be converted to a closed system.
In this way the SL can be operated as a class 1 or class 4 laser, depending on production requirements.

Modular Construction:

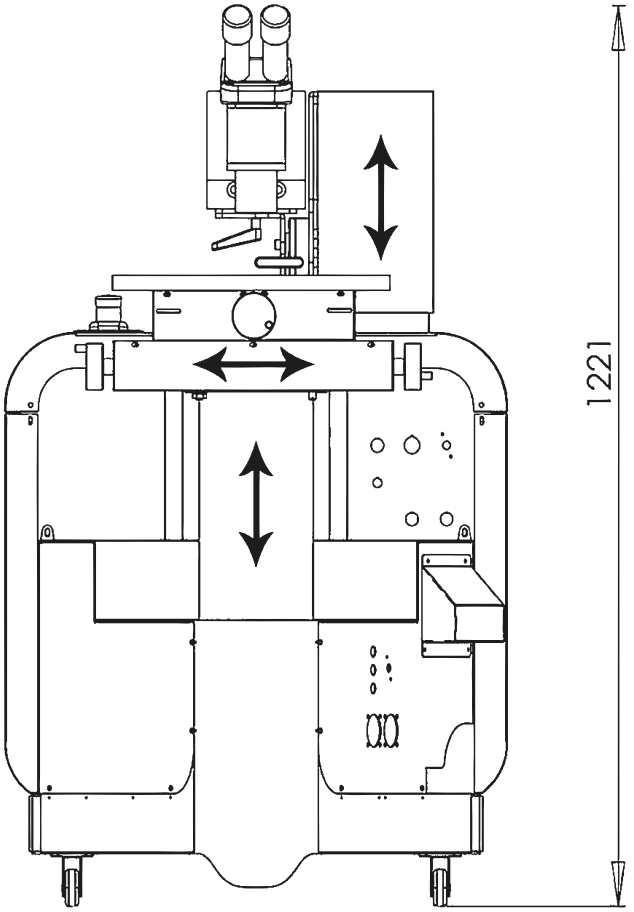
The operation of the working table is manually or motorized. Both versions provide a high precision during the process of welding.

The pivoting arm maximizes the accessibility.

Two motorized z-axes are integrated as standard in order to provide the required ergonomical operation.

Beside that, the stationary "SL" can be upgraded to a mobile "MW" welding system at any time.

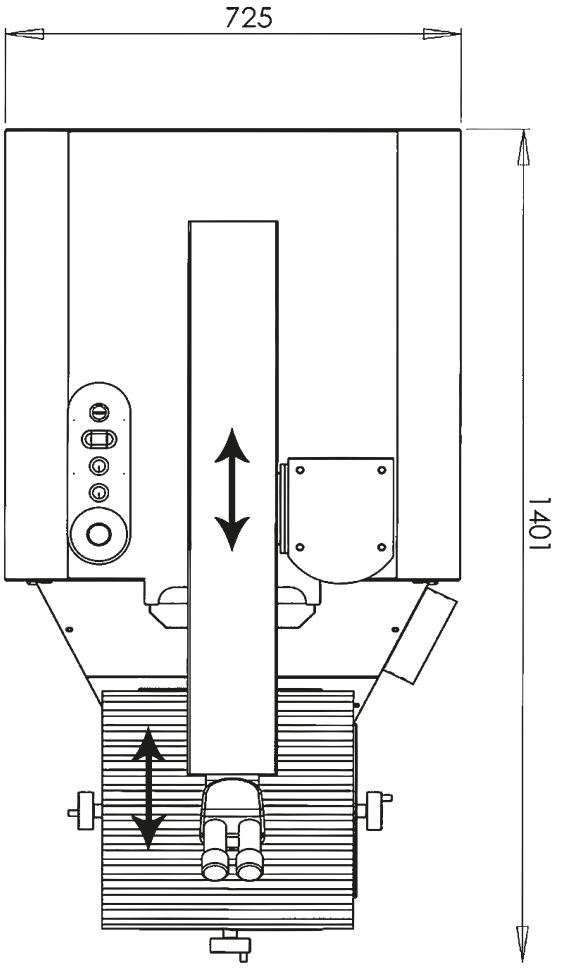
Due to the innovative power level technology the laser power can also be upgraded from 60 to 500 Watts at any time.



Ergonomic

Two motorized Z-Axes for a more ergonomic comfort are integrated as standard.

Motorized table with multifunctional joystick is available as option.



Compact

The "SL" laser system provides all required options for the repairing and welding applications of components within a compact area.

Mobile Welder

Laser Power
up to 500 Watts

Wide range with extra performance and with even more on request

The "Mobile Welder" modular laser system has been specially designed for repairing large tools and molds. These may range in size u to 25 tons.

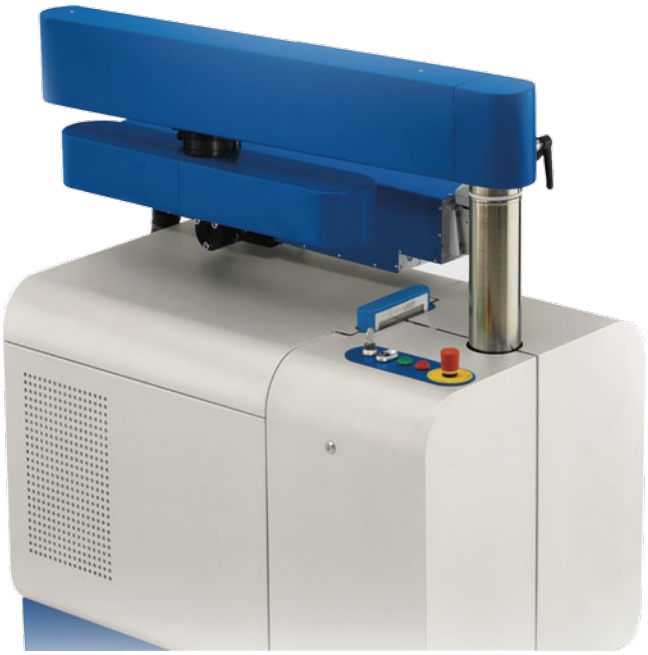
The mobile welding system is so flexible that even hard-to-reach work pieces can be processed very accurately and at an astonishing speed.

The system is available with laser powers from 60 to 500 Watts. The innovative power level technology allows the machine to be upgraded to higher powers any time later.
Therefore, Mobile welder can be individually adapted to your applications.

The core benefits of the Mobile Welder:

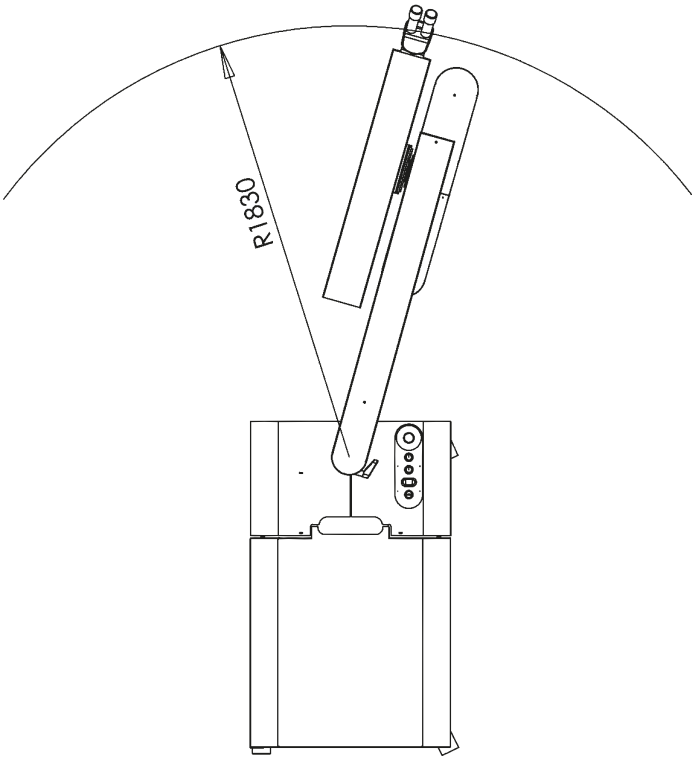
- Designed specifically for the welding of large tools
- Stable construction
- Smooth axes
- Mobile construction on steered rollers
- Long travel
- Modular upgrades available up to 500 Watts

Safe transport and safe working in any position



The folding rotary and swivel arm reduces the space required in the transport position, thus providing easy and safe transportation.

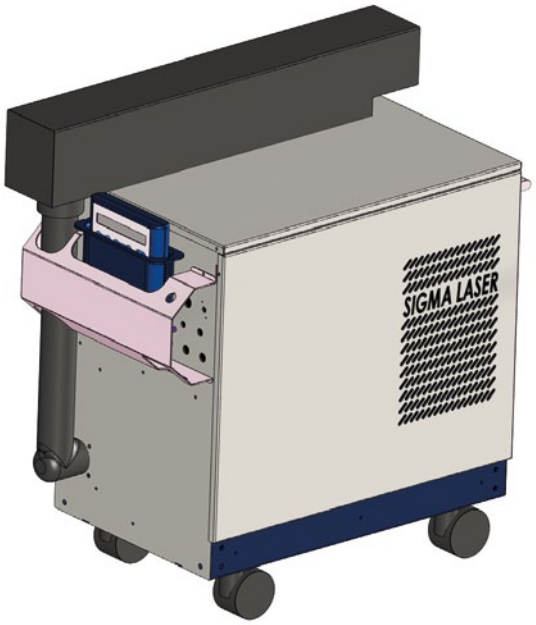
The swivel arm has an impressively high degree of flexibility and, above all, a wide range of more than 1830 mm.



QMax

Precise Intelligent Reliable

The unique QMax system offers an enormous range of flexibility for complex repair welding tasks.
All necessary axes are integrated within the welding head. The intelligent solution allows the handling of even the largest molds.
The laser power is transmitted to the welding head via fiber cable.



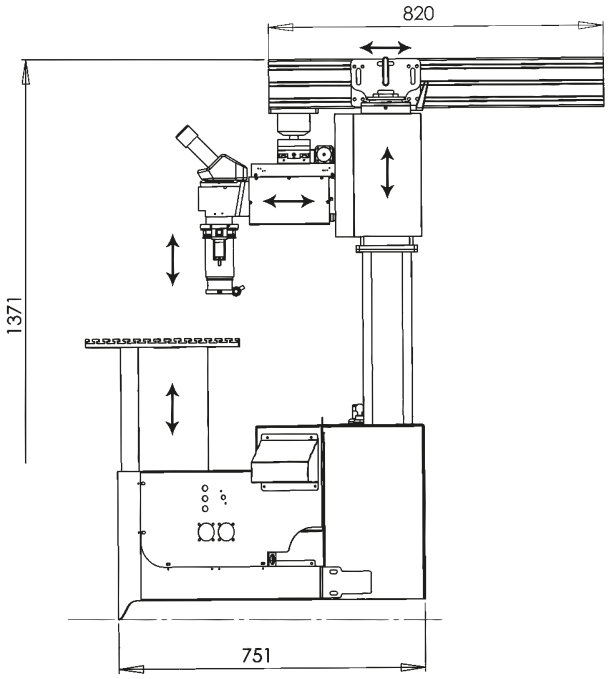
Flexible Compact Ergonomic

The ball joint enables the quick and flexible positioning of QMax.

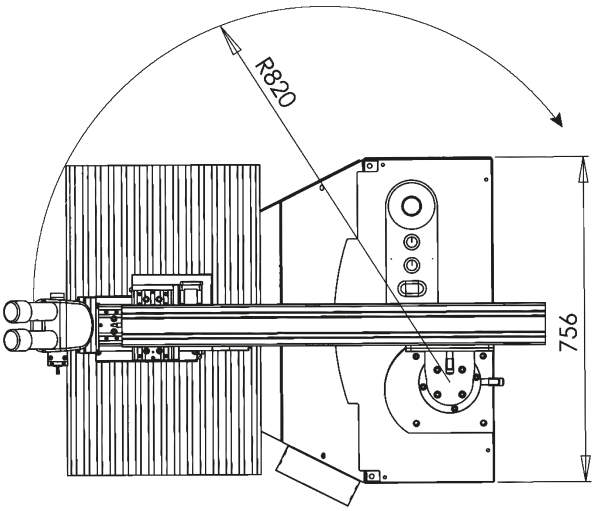
The welding head including the three axes is detachable. Therefor even welding inside of mold injection systems is possible.

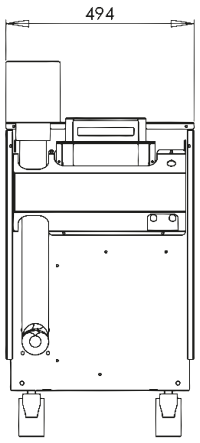
Nd:YAG-Laser: With laser powers between 120 to 330 Watts and up to 20 meters of fiber cable.

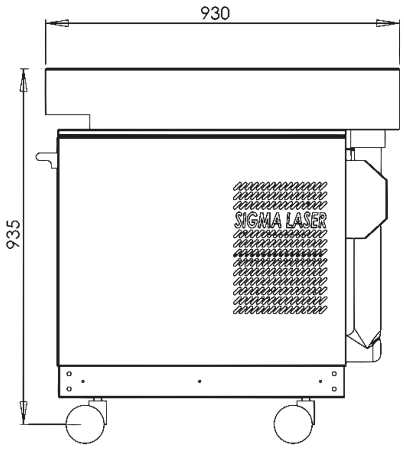
Features:



- Three moving axes are integrated into the welding head: 150 x 100 x 100 mm (x-y-z)
- Two separate Z-Axes for ergonomic positioning of the working table and the welding head
- All moving axes are controllable via the multi functional joystick
- For tools and components up to 500 kg
- 180° sviwel arm with 820 mm working radius







Features of the beam source:

- Industrial fiber cable with protection and plug
- Twin lamp cavity for higher beam quality and longer lasting flash lamps
- Advanced remote diagnostics system
- Motorized beam expander
- High pulse peak power
- Memory function for welding parameters
- Laser power upgradeable up to 330 Watts at any time
- External cooling system
- Laser class 4

Marking Laser ML

Laser Power
up to 40 Watts

Precise Laser Marking

The Marking Laser ML is designed for a wide range of applications and satisfies the highest demands in precision and productivity.

A motorized Z-Axis is integrated as standard in order to provide the optimal adaption to the users individual components.

The innovative scanner optic enables a higher working speed whilst maintaining consistent engraving quality.

The open construction is a design feature that ensures high economic efficiency for the user during the positioning and handling process.

The ML laser system was designed to fulfill the requirements of high precision graving tasks while ensuring the comfortable operation of the system.

Other advantages:

- Stable construction
- Large marking area
- Exact positioning through pilot laser
- Extra energy saving and efficient
- With optional available cover: Laser Class1

Remote Diagnostics

When service overrides the constraints of physical distance

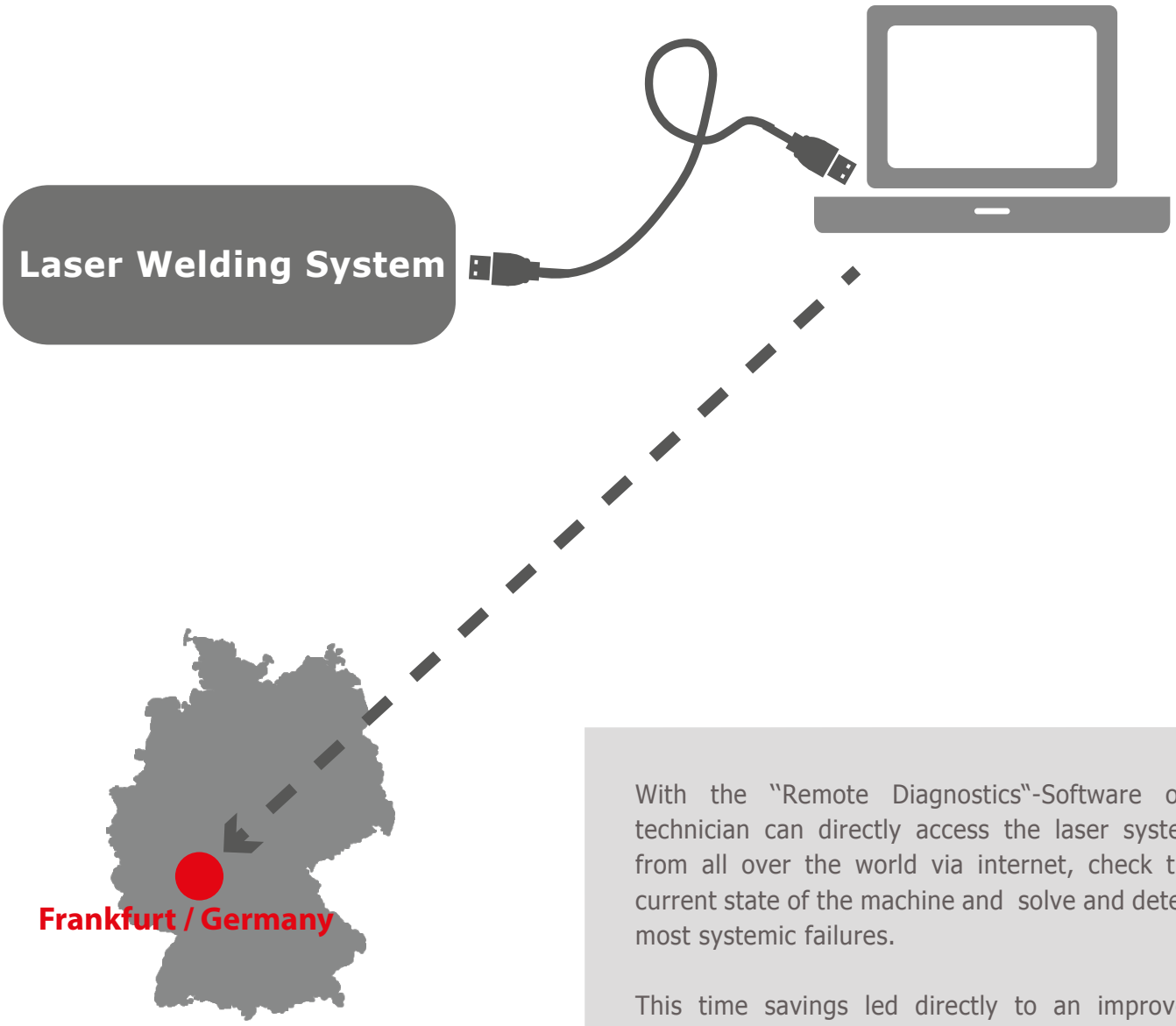
Avoid system downtime trough Remote Diagnostics

Remote Diagnoctics is the first choice to identify maintenance requirements in the medium term and to avoid machine downtime.

All our laser systems can be examined with this feature via internet regardless of where in the world they operate.

This will contribute decisively to reduce on-site services and minimize the the associated travel and personnel costs.

All you need is a laptop and our special software.



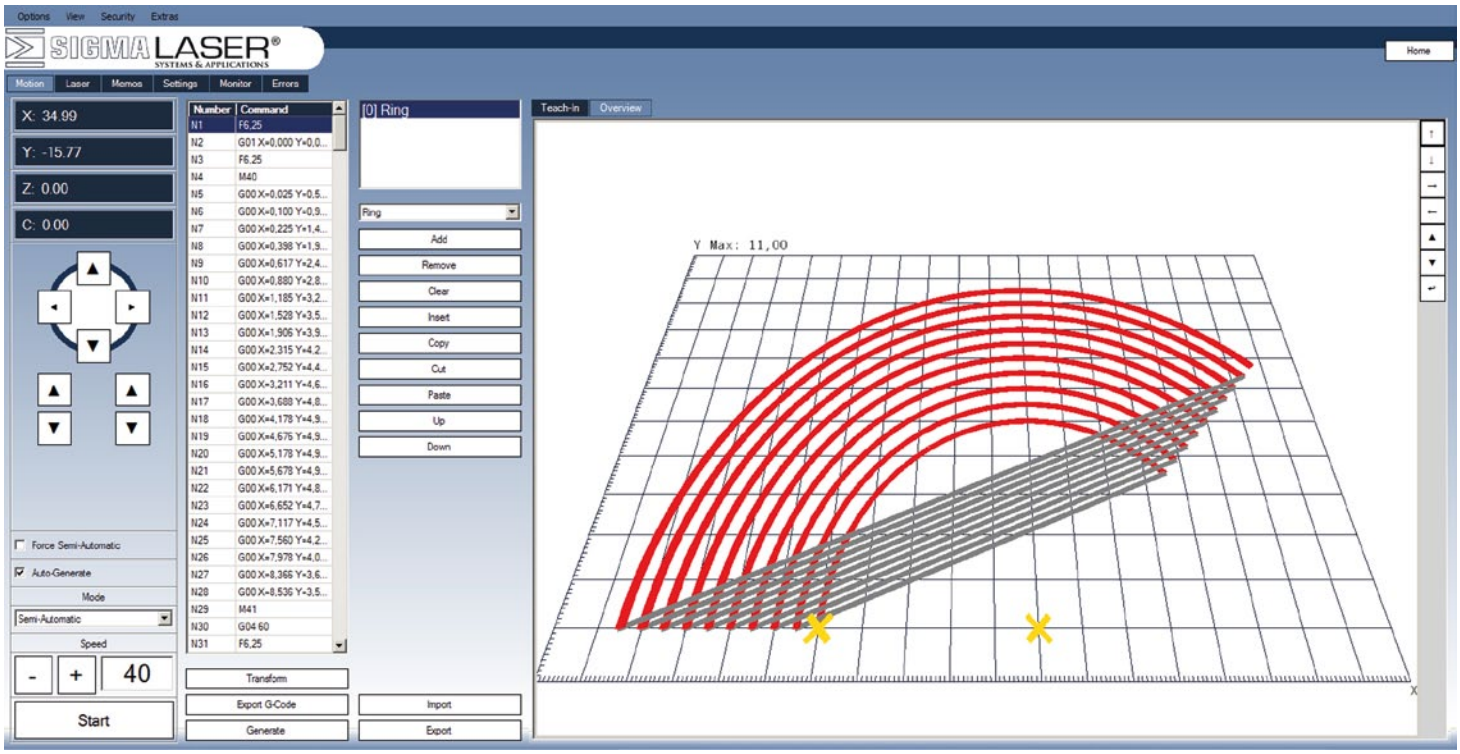
With the "Remote Diagnostics"-Software our technician can directly access the laser system from all over the world via internet, check the current state of the machine and solve and detect most systemic failures.

This time savings led directly to an improved utilisation of your systems production capacity.

CNC-Software Sigomatic

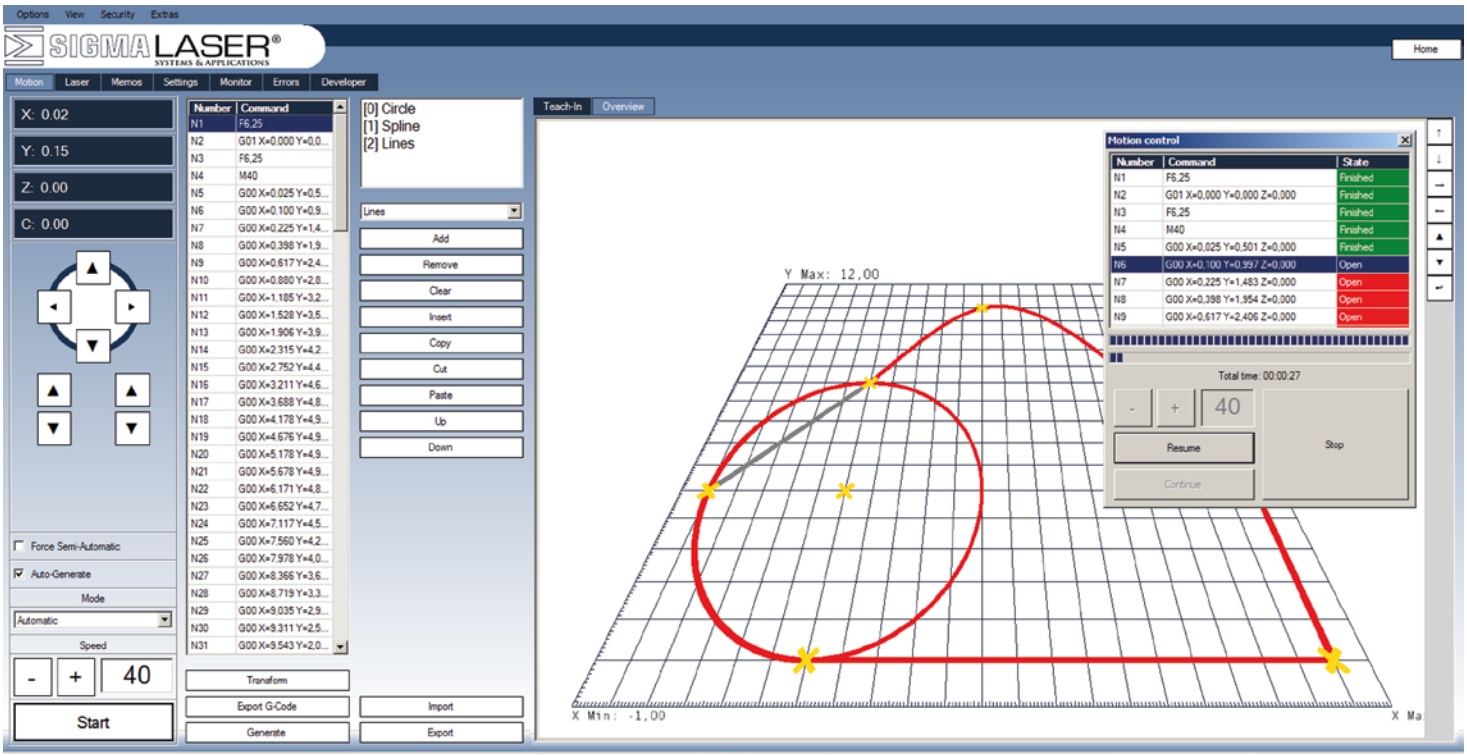
The Sigomatic CNC-Software provides an easy automation to your welding task and optimises your production processes.

The software was especially developed for complex laser welding applications and offers a wide range of functions such as part- and full-automation for serial production but also provides features for repair services in 3D.



The intuitive and fully graphical interface provides a simplification of operation so even unexperienced users can program and create CNC-controlled welding-seams in a short period of time.
For this purpose the software provides the basic geometries (line, circle, polyline, polycircle, spline) which can be used to compile your own individual welding-seam.

The included Teach-in–Function is used to transfer and permuting the requested welding parth, based on the real components geometry directly into the CNC program.
Furthermore simple marking applications can be done using the integrated text box. In both cases the commands will be displayed directly as G-Code so that experienced users can create and simulate their programs according to DIN ISO 66025 on an external laptop without having to block valuable machining time.
The graphical representation shows a first review of the welding-seam and facilitates the monitoring of the real welding process.



- Nearly unlimited number of data points (depends on computer performance)
- Programs can be memorized
- Visualisation of the programmed welding path
- Teach-in-Function for all axes (X-Y-Z and Rotary Device)
- Command output in G-Code
- Performing Marking Applications
- Intuitive and fully graphical interface
- Possibility of recalling welding parameters for individual sections of the programmed track

Additional Equipment

More possibilities for more movement:

Multifunctional Joystick

- Analogue and digital operation possible
- Jog-Off-Function
- Vmax-Function for fast operation
- Coordinate inversion function
- 4-Axes control: Control of a motorized rotation device is already integrated
- Freely programmable buttons for your own applications
- Pulse-Automatic

CNC-Controller

- Later upgrade with CNC-Controller available
- Interpolation of 4 axes
- Up to 8 axes upgradeable
- Teach-in-Function and 4 GB Memory
- Integrated G-Code-Interpreter
- Network compatible
- Driver for peripheral devices

Technical Data*	P 60	P 120	P 160	P 220	P 330	P 420	P 500
Nd:YAG-Laser	Wavelenght 1064 nm						
Power level	L1	L1	L1 / L 2	L2	L2 / L3	L3	L3
max. mean power	60 W	120 W	160 W	220 W	330 W	420 W	500 W
max. pulse energy	60 J	80 J	120 J	120 J	120 J	120 J	120 J
pulse peak power	6 kW	9 kW	13 kW	13 kW	13 kW	13 kW	13 kW
pulse duration	0.5-20 ms	0.5-20 ms	0.5-50 ms	0.5-50 ms	0.5-50 ms	0.5-100 ms	0.5-100 ms
repetition rate	0.5-20 Hz	0.5-20 Hz	0.5-20 Hz	0.5-20 Hz	0.5-40 Hz	0.5-40 Hz	0.5-40 Hz
focus diameter				0.2-2.0 mm			
beam expander				motorized			
pulse shaping	no	yes	yes	yes	yes	yes	yes
flashlamp	1	2	2	2	2	2	2
Memory function	50 storage places (upgradeable to 100)						
Controlling optics	Leica Binocular with large oculars						
Power supply	380 V / 3 Ph / 50 Hz						
Cooling system	——— water / air - integrated ——			———— water / air - external ————			

Options

> selectable power level
> prefabrication for higher power levels possible
> motorized rotation device
> remote diagnostics
> CNC-Controller
> swivel optics with telescope lense
> Leica camera system
> Sigomatic - Software, Teach-In- or CAD-Data-Transfer
> automatic wire feed system
> optional high-power cooling system
> special suction system for laser welding applications

Contact

Laser Innovations from Germany - represented around the world

Sigma Laser GmbH stands for the highest quality and expertise in the field of laser technology. We supply state-of-the-art solutions for industries all around the world through our innovations.

Currently Sigma Laser is represented in 21 further countries.

- Sigma Laser Frankfurt a. M.
- Bulgaria
- Canada
- Croatia
- Czech Republic
- France
- Hungary
- India
- Iran
- Mexico
- Poland
- Portugal
- Romania
- Slovenia
- Singapore
- South Africa
- South Korea
- Turkey
- UAE
- United Kingdom
- USA

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