

Laser welding and cleaning station



Customer-oriented machine solutions

Machine Stand Alone Five

MSA-Five is a versatile machine platform that complies with CE machine directives and laser safety regulations. It is adaptable to a wide range of solutions and is compatible with comprehensive clamping and optics. The standard version can be enhanced with a rotary indexing table and conveyor belt.

MSA-Five is a modular laser processing platform that encompasses all necessary solutions for welding and cleaning operations. By seamlessly integrating robots or multiple axes with process-specific lasers and advanced optics, the system can be customized for a wide range of applications. Productivity is further enhanced through the incorporation of a rotary table or conveyor belts, enabling automated or semi-automated handling of components during processing.

The platform features a modular control software designed for the seamless integration of supplementary options and accessories. Real-time machine vision characteristics, supported by visible and thermal cameras, along with comprehensive complementary sensors for quality assurance, enhance the system's capabilities. An online process control system, integrated into the control interface, includes pass/fail evaluation. Upon installation of the turnkey system, production can begin promptly.

Technical Data	
Laser Wavelength	808 nm and 1070 nm
Laser Type	Fiber Laser
Beam Guidance	Standard QBH
Laser Power	Up to 6 kW in CW;
Laser Cooling	Deionized water
Multilaser	Yes; (Optional dual laser)
Working Dimensions	*550 x 550 x 480 mm
Movement System	Linear axes; Robot
Rotary Axis	Yes (Optional)
Rotary Table	Yes (Optional)
User Interface	EXOM HMI; DYLABESH
Communications	Customer specific: Ethernet; TCP/IP; Profinet; CANopen; Digital/analog I/Os
Air Pressure	6 bar
Voltage	400 V; 3x
Frequency	50/60 Hz
Electric Power	10 kW
Ambient Temperature	10 – 45 °C
Humidity	69% at 35 °C
General Dimensions	2300 x 2260 x 2260 mm
Laser Class	Laser class 2M
Noise Emission Level	<70 dB(A)

*Optional adapted working area

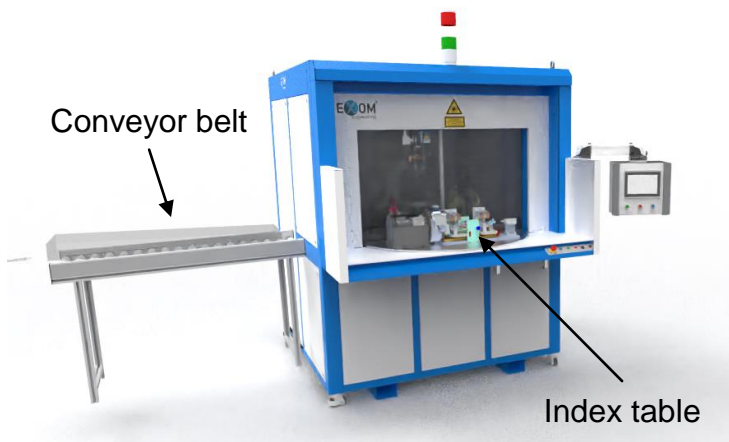


CE according to EU machine directive and certified laser safety standards



Versatile system concepts

EXOM Engineering designs and configures laser systems to precisely align with our customers' needs and applications. The working platforms provide ample space for tailored adaptations to meet specific customer requirements.

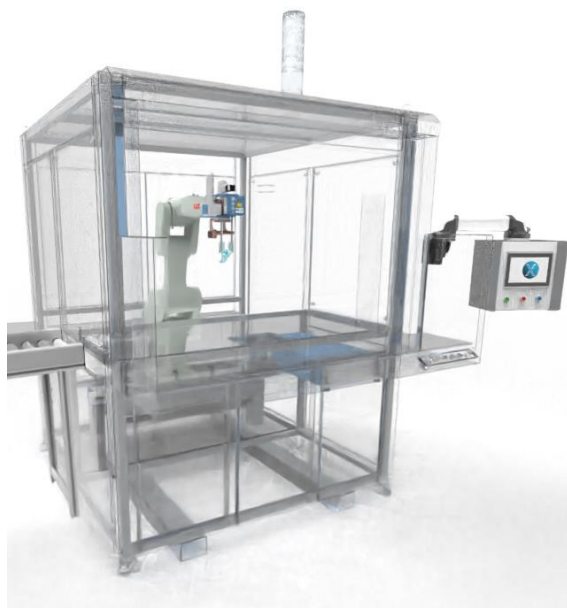


MSA-Five is a flexible platform built on standard components, expandable to meet customer-specific requirements. This includes:

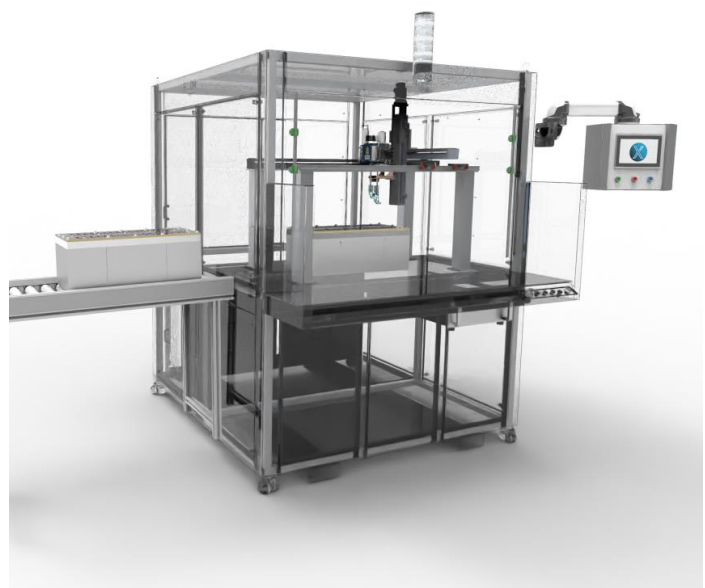
- Camera-based parts detection or process monitoring (VIS and thermal)
- Laser type (CW/Pulsed) and power
- Optical head and configurations
- Sensorics and data management
- On-line quality assurance
- Robot or axis solution
- Conveyor belt or index table
- Tailored clamping systems

Engineered to clean and weld a wide range of components, from simple geometries to complex parts. The workstation is designed to incorporate linear axes for precise part processing, or robotic arms when superior flexibility is needed due to complex part geometries and weld accessibility.

MSA-Five Robot



MSA-Five Cartesian



Scan Optic 3

MSA-Five laser workstation is compatible with all optics and accessories developed by **EXOM Engineering** for various cleaning and welding applications.



Scan Optic S03 integrates up to two independently controllable laser modules in a single wobbling optic. It controls and adapts the energy input on the material either spatially and/or temporally, through a real time embedded control card **CC-SdLED®** and the data coming from high-speed IR sensors and cameras.

The modular multi-laser approach provides a new level of cost-effective flexibility for applications, combining different wavelengths and modes (CW, pulsed), better adapting the laser processing features to material and application requirements.

The result makes it possible to overcome current limitations in joining dissimilar highly reflective materials, such as aluminium and copper.

Key Features

Processing Head	
Power Rating ¹	Up to 5 kW (laser 1) and up to 6 kW (laser 2)
Clear aperture	20 mm (laser 1), 18 mm (laser 2)
Mirror Sweep Angle	800 mrad (45.8°)
Resolution	1.048.576 steps
Drift Measured Over 8 Hours	<24 µrad
Positioning accuracy (250 mm FL)	6 µm
Working area (250 mm FL)	35 x 35 mm ²
Collimator focal lens ²	60 mm, 83 mm, 100 mm
Focusing optics diameter 76,2 mm ³	250 mm, 350 mm (other lenses on request)
Air knife	Air curtain for cover lens protection
Fiber Connector	QD (LLK-D, LCA), QBH (HLC-8)
Weight	~12 Kg
Options	Off-Axis illumination LED or laser, robot arm mount

¹ Optional 1 or 2 laser configurations (Scan optic S02 and Scan optic S03)

² Other collimator lengths available depending on integrated laser source and characteristics

³ Optional IR-Optics (infrared range extended optics) for high-resolution temperature measurement

Wobb-Welder

MSA-Five Robotic cells and highly flexible manufacturing processes can reap the advantages of the small and lightweight laser optic Wobb-Welder. The reduced weight and volume enhance processing flexibility, enabling more compact robot solutions and reducing the overall machine footprint.



The Scan Optic **Wobb-Welder** is a compact and lightweight laser optic solution meticulously designed for seamless integration with robots.

The real-time embedded control card, **CC-SdLED®**, along with information from high-speed IR sensors and cameras, enables precise control and adaptation of energy distribution on a material both spatially and temporally. Moreover, the wire feeder and seam tracking modules are fully compatible with this Laser Wobbler, making the optic well-suited for structural laser welding applications.

Key Features

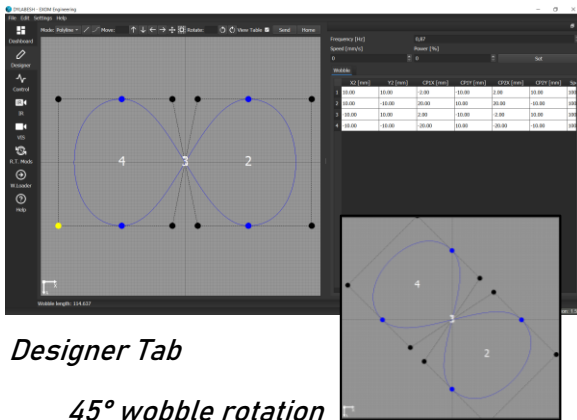
Processing Head	
Power Rating	Up to 3 kW
Clear aperture	max. 20 mm
Mirror Sweep Angle	200 mrad (11.46°)
Resolution	1.048.576 steps
Drift Measured Over 8 Hours	<24 µrad
Positioning accuracy (250 mm FL)	6 µm
Working area (250 mm FL)	10 x 10 mm ²
Collimator focal lens	83 mm, 100 mm, 120 mm
Focusing optics diameter 50 mm	250 mm, 350 mm (other lenses on request)
Air knife	Air curtain for cover lens protection
Fiber Connector	QBH (HLC-8)
Weight	~ 9 Kg
Options	Off-Axis illumination LED or laser, robot arm mount

* *Optional IR-Optics (infrared range extended optics) for high resolution temperature measurement*

* *Optional part seam tracking*

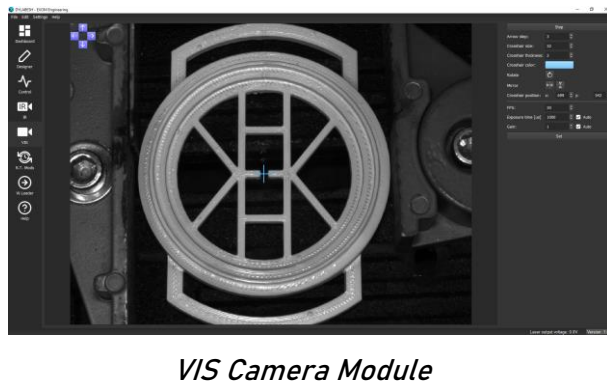
Process automatization Software

Modular software for process control and quality automatization, based on real-time part and event detection. The process information is captured with sensors, including visual and thermal cameras, pyrometers, distance, or force sensors.



SdLBS®

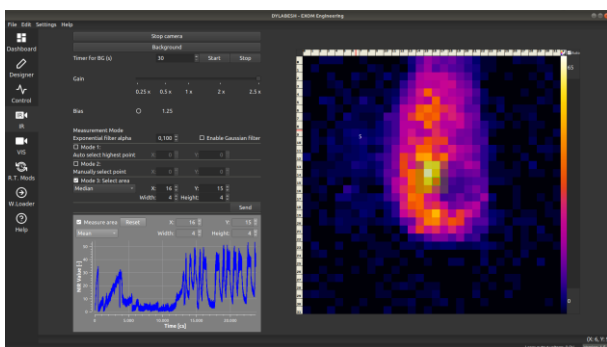
Software defined Laser Beam Shaping is the technology implemented and developed by **EXOM Engineering** for laser industrial applications. It is based on the possibility to use oscillating optics (e.g. scanner heads) with the aim of shaping the laser beam adapting it to the requirements of the material and process.



VIS Module

Allows the operator to precisely position the part under the laser optics, setting-up the camera configuration.

Additionally, artificial vision algorithms can be implemented in the dedicated control card installed in the laser scanning head, offering solutions for quality assurance and process monitoring.



Infra-Red Control Module

This Module is based on the use of a Near Infra-Red camera (e.g. NIT Tachyon 1024, Tachyon 16k plus) to close-loop control laser processes. Measurement areas and modes, as well as different temperature ranges can be chosen.

Services

EXOM Engineering offers services with a comprehensive approach, encompassing everything from product development and series readiness to after-sales service. We prioritize a fast response and adopt a problem-solving approach at every step of the process.

Process development and optimization

We specialize in data processing and process control for laser welding and cleaning. As experts in the field, we can provide valuable advice on the best system approach and configuration for your application. Our responsive engineering team, coupled with our well-equipped application lab, is dedicated to supporting you in enhancing your processes, selecting optimal machine solutions, determining processing parameters, and testing final results. Leveraging our proprietary technology solutions and laser processing know-how, we aim to significantly improve your productivity and manufacturing processes.



System Customization:

At **EXOM Engineering**, we leverage our knowledge and integration experience to provide customers with the option of tailoring our laser systems to better suit specific requirements or preferences in their processes. This flexibility extends to various aspects of the machine, including hardware, software, interfaces, and functionalities.

Our ultimate objective is to align our solutions with the customer's specific needs, enhancing manufacturing efficiency, usability, and competitiveness in their respective markets. Throughout this customization process, we prioritize machine reliability and uphold stringent safety standards.

After sale services

Laser welding systems represent an investment that demands regular care. To meet this need, we provide preventive and corrective maintenance contracts tailored to each system and customer's specific requirements.

Our integral approach to interventions includes:

- Technical support
- Remote on-line analysis
- On-site repair in the event of system errors

We prioritize the integration of reliable components from well-known suppliers in our machines, ensuring both product quality and the swift availability of spare parts. This commitment underscores our dedication to providing comprehensive and effective after-sales support.

For further information please don't hesitate to contact us!

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