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Laser. Marking. Solutions.

ACI


# Magic Mark

## Laser marking software

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Magic Mark is ACI's proprietary marking software. It contains all the functions required for working with a manual Workstation or an integration solution.
This software is used to create marking programs and to monitor and control both the laser and the laser peripheral devices. As the interface between the user and the laser system, the main focus of any further development is always ease of operation for the user. Based on customer feedback and our own innovations, Magic Mark is constantly being further developed in order to efficiently increase our laser systems' performance and therefore their processing quality.

CONTENTS

# Functions

Controlling several lasers with only one PC

Magic Mark laser software

Several instances of Magic Mark running in parallel on one PC can control several lasers. Within this system, the lasers can communicate with each other. The number of lasers can be scaled as required and is only limited by the processing power.


## Graphic objects

- Precise entry of parameters
- Single-line fonts and all TrueType fonts
- Circular and multiple-line texts
- Various formats for numbers, date, time, etc.
- All common barcodes (1D codes), data matrix codes (2D codes), QR codes
- Basic objects (vector, circle, rectangle)
- Graphic import of various formats (DWG, DXF, HPGL, BMP, JPG, GIF and PDF)
- Filling all polygon-based objects
- Rotating, resizing and moving all objects

## Integration into production lines

- Powerful scripting language for controlling machine processes (handling systems)
- Operation as a taskbar icon without a visible window
- Communication with other programs, including via socket interface or file-based
- Communication with external devices via various interfaces
- Access to databases

## Managing all laser parameters

- Power
- Speed
- Frequency
- Focus shift
- Delays
- Interfaces

# Benefits

STANDARDISATION

## Magic Mark is an object-oriented and solution-orientated software without a CAD core

Marking template files created in customer-specific programs can be easily imported into Magic Mark. Conversely, it is possible to export designs created in Magic Mark as high-resolution PDFs. This increases the user-friendliness of the software, as users can work in their usual programs to create the template file.

Graphic and image data from different sources can be merged in Magic Mark and embedded in a laser template file without the need to refer to the data source. On the other hand, data can also be processed in placeholders so that an explicit data source is used.

Magic Mark uses the standard fonts installed on the Windows PC (TrueType fonts and OpenType fonts) and user-defined fonts.

INTERFACE INTERCHANGEABILITY

## Marking files in XML format

Marking files created in Magic Mark are saved in XML format so that their contents can be read with standard programs such as Windows Editor or Visual Studio. Marking files can therefore be created and modified outside of Magic Mark. There are clear interfaces between the departments, one work step is saved and the entire process is therefore simplified.

EXTERNAL CONTROL

## Cross-platform and cross-manufacturer communication

In addition to the wide range of graphical functions, Magic Mark provides a Visual Basic programming module which simplifies integration into production lines. The software can also be controlled using external .NET programs. Software add-ons enable cross-platform and cross-manufacturer communication between Magic Mark, the laser and external devices. The advantage of this is that external devices can be added without having to program individual software interfaces. For example, a laser connected via the socket interface or a Workstation can be controlled by a PLC, a Linux PC or other connection partners.

# Benefits

TASK-SPECIFIC USER INTERFACE

## Simplified process and reduced training requirements

A task-specific user interface can be created for the user, which focuses on a particular marking task or workflow. Unused control elements can be hidden.

These types of user-specific views can be created via Magic Mark's internal basic script or via external C# applications and simplify the process or reduce the amount of training required for changing operating personnel.

INCREASED PERFORMANCE WITH PLUGINS

## Expansion of functions and optimisation

Innovative software add-ons allow the laser functions to be flexibly expanded. An extensive selection of useful plugins is available. These modules can be integrated into Magic Mark depending on the application requirements. Plugins are instrumental in optimising the marking quality and the production process as a whole.

COMPATIBILITY AND EASE OF MAINTENANCE

## Machine-independent Magic Mark software solution

The basic structure of the Magic Mark program interface will not be changed; only state-of-the-art adaptations will be made. This reduces the amount of training required and simplifies commissioning after new installations or updates. In this version, too, there is also a high level of compatibility with previous versions. In addition, Magic Mark is easy to maintain, as the software is not tied to the laser system, but is machine-independent.

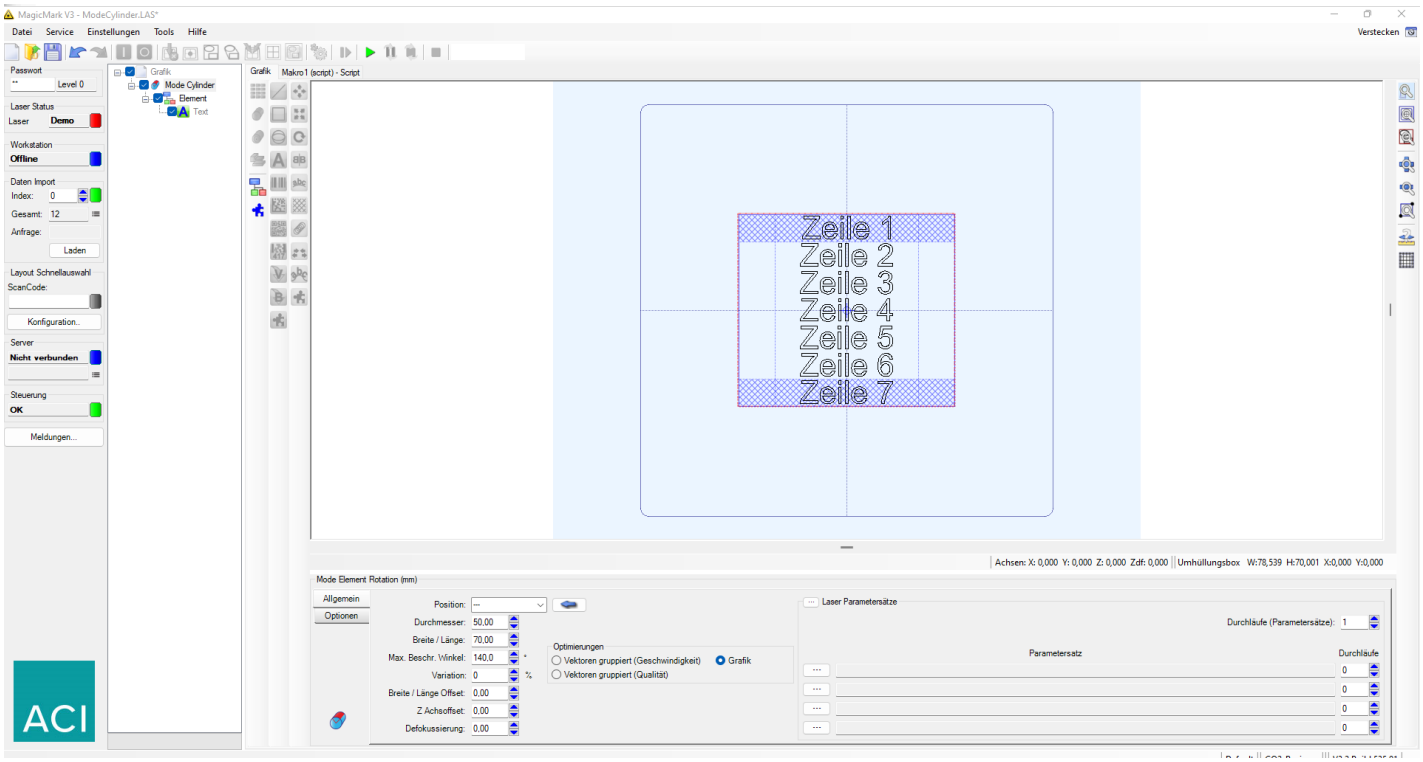
# Mode Cylinder

The Mode Cylinder element enables layouts to be marked on cylindrical components at an angle of up to approximately 140° without an axis of rotation. The marking content is automatically segmented into Z-levels that correspond to the optics' depth of field. The focus is adjusted/tracked incrementally using the Z axis or focus shifter. Magic Mark performs a fully automatic distortion correction of the marking layout.

### Key features

1 Circumferential marking of up to approx. 140 degrees without a mechanical axis of rotation

After entering the object diameter once, 180 degrees of the object circumference is displayed in the Magic Mark graphic preview window as an unrolled surface. The guide lines shown on it indicate the area on the object that can be marked. A grid view visually blocks the areas in which no layout elements should be placed.




A combination of different mode elements in the graphics tree is possible depending on the marking task. The large workroom of a Workstation Professional can be used, for example, with the Mode Cylinder and Axis Array elements for marking several round components in a single pass. To do this, position a component in the workroom of the Workstation and create a one-off layout for multiple marking.

In the downstream processes, all that remains to be done is to place the components in the Workstation and start the marking process.
The Mode Cylinder element is particularly interesting for existing customers who already work with a Workstation and want to implement circumferential marking up to a certain segment angle. It can be used immediately with the current version of Magic Mark without any additional set-up time.

# Mode Rotation

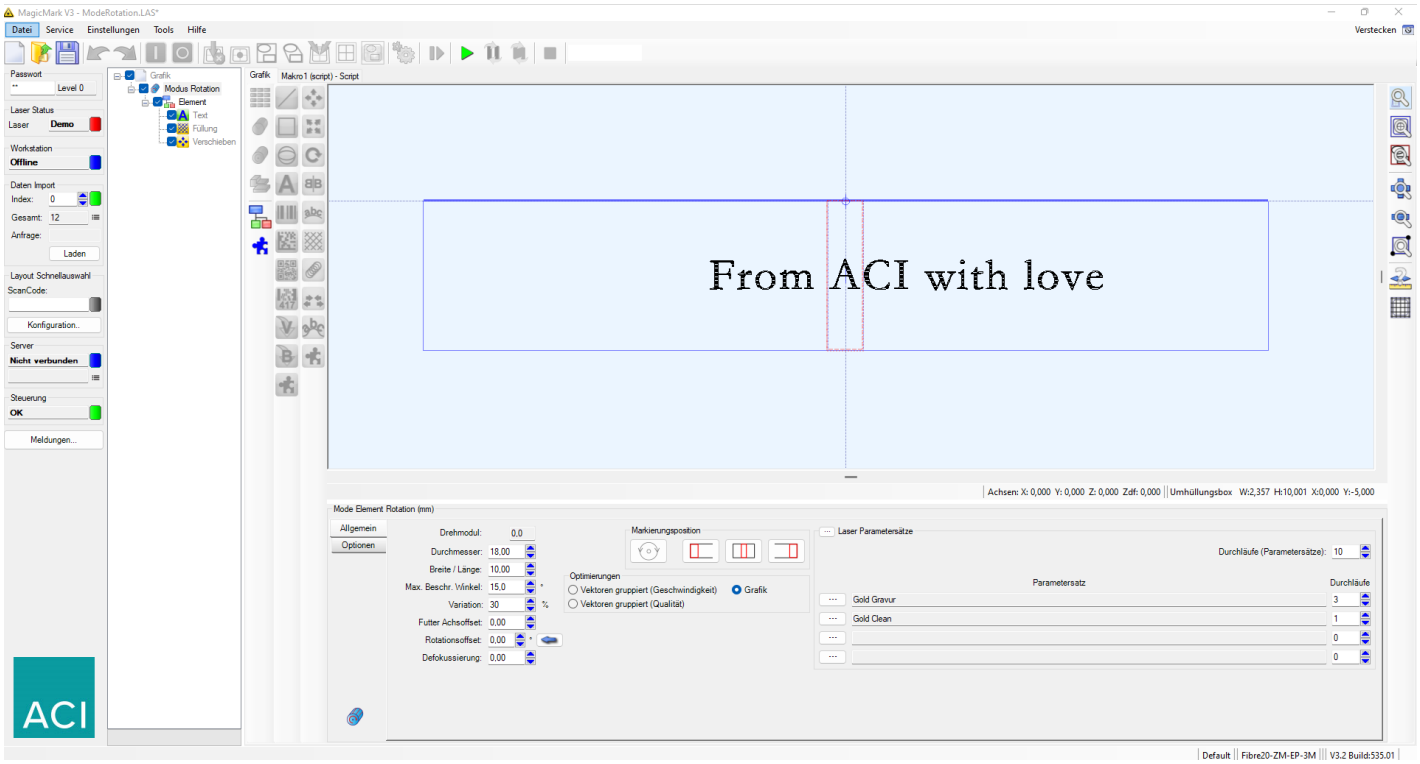
The use of a numerically controlled axis of rotation enables uniform laser marking around the circumference of cylindrical objects. Magic Mark automatically divides a marking layout into several individual segments depending on the laser configuration and the segment size specified by the user (maximum marking angle).

The segments can also be smaller if this makes it possible to avoid cutting contours. The aim is to mark content as a whole within segment boundaries and therefore avoid visible lines. During the marking process, the angle of rotation of the rotation axis is positioned separately for each segment and then the object in focus is marked.

**Key features**

1 Circumferential marking of up to approx. 360 degrees with a mechanical axis of rotation

An optional imaging system integrated into the beam path of the laser system enables the marking layout to be precisely positioned on the object.




Magic Mark user interface with graphic preview window: Unrolled surface of a ring with marking layout – red frame indicates the maximum marking angle

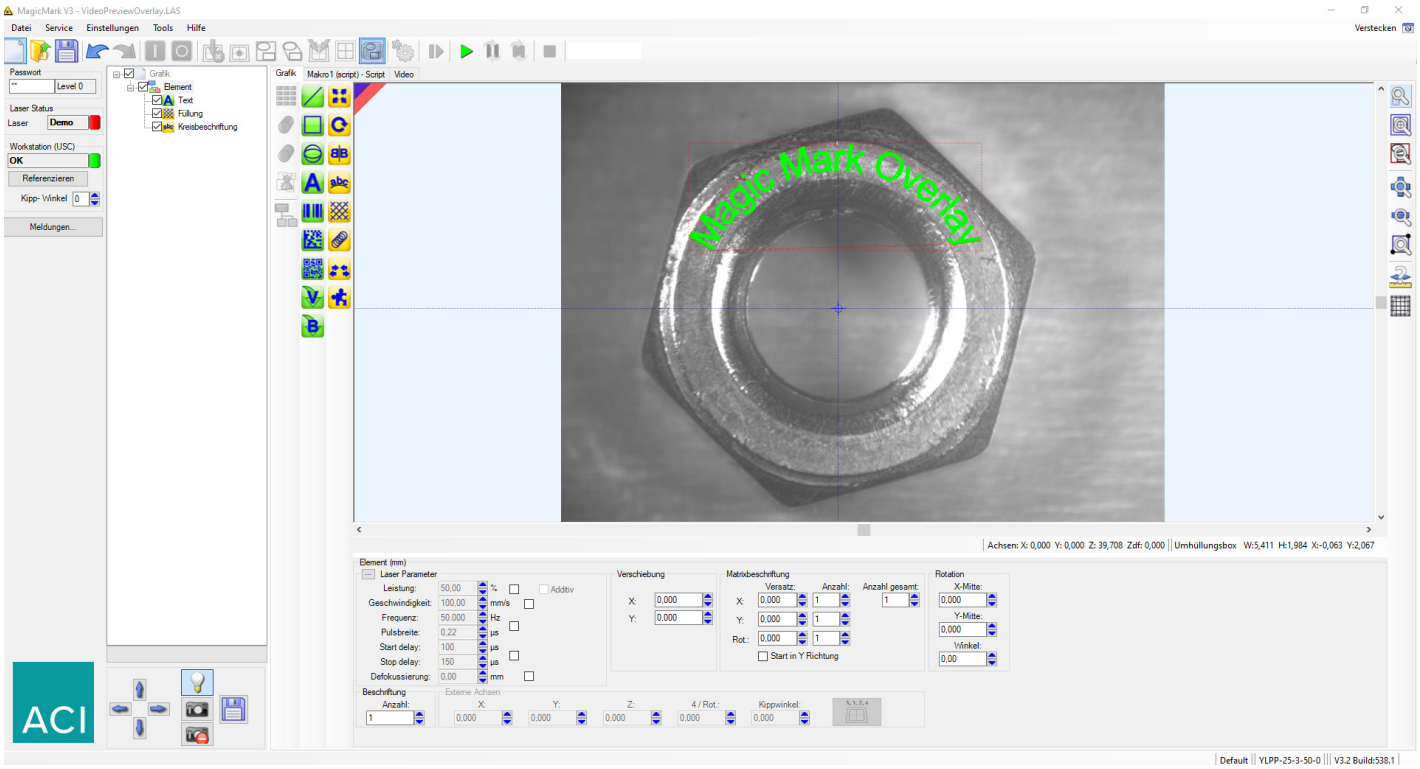
# Video preview overlay

As soon as a camera is connected to the laser system, it is recognised by Magic Mark and displayed in the video area. The object to be marked can be overlaid with a live video image in the Magic Mark graphics window. This camera preview function (video preview overlay) makes it much easier to align the layout on the object.

This function is used for internal and external CPM. CPM (capturing, positioning, marking) is an imaging system available from ACI. The function is particularly useful for sensitive applications regarding the positioning of marking content on objects with complex shapes and is used for process control and optimisation.

**Key features**

1 Error-free positioning of marking content



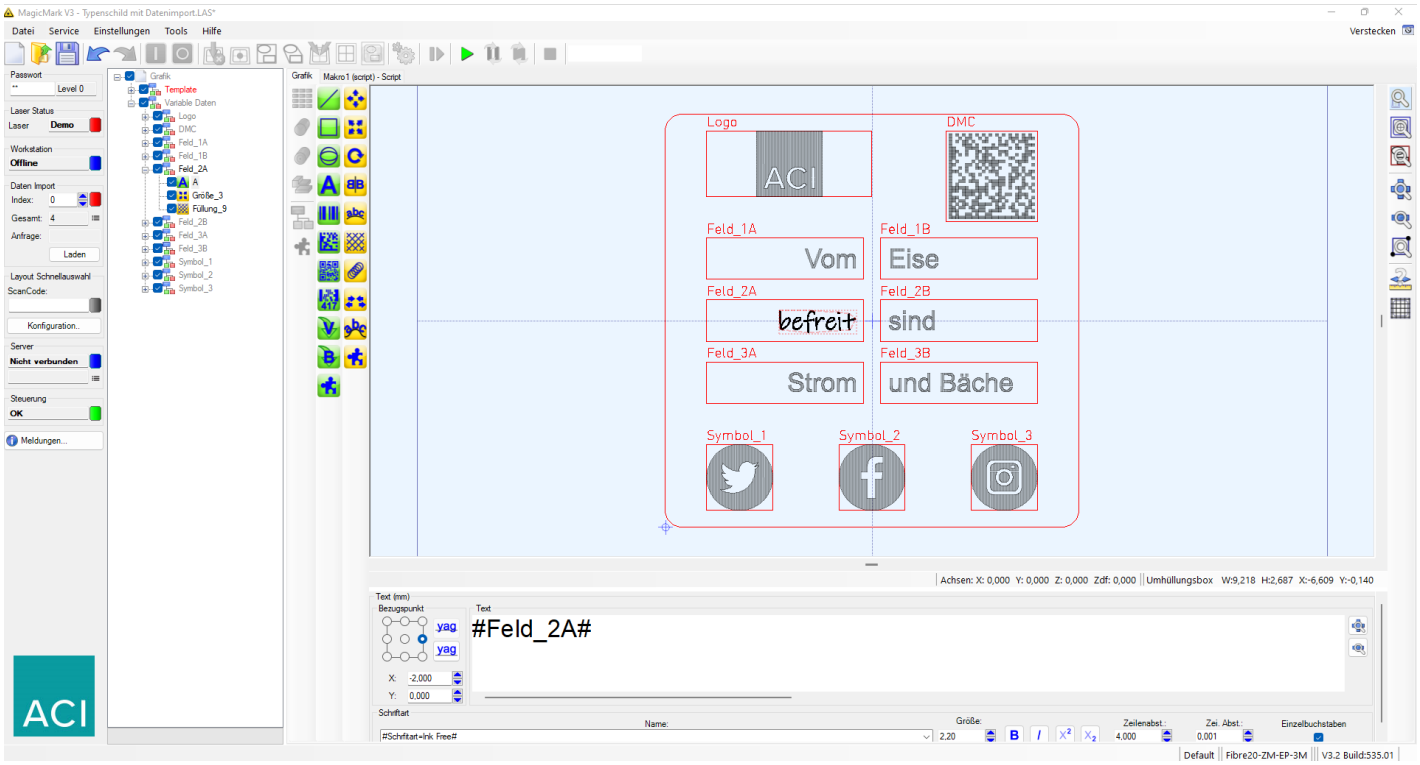
# Variable management

Using the Data Import plugin, data can be imported from a data source. This may be a relational database or, in the simplest case, a data file – for example, an SQL database, OLE DB, ODBC, binary data file (TXT, CSV) or XML data file. It is possible to select a data source and a data record both via the Magic Mark user interface and via a script.

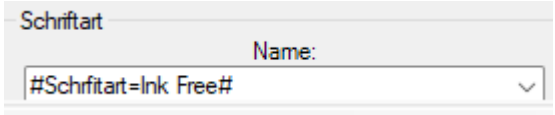
The selected data records can be transferred to a marking file using a variable entry and output consecutively. Variables can be entered in the Magic Mark input fields. This works equally well for objects, modifiers, elements and mode elements.

**Key features**

1. Copying variables during the laser runtime
2. Greater flexibility in the marking process




The font of the text element in field_2A was changed using a variable in the corresponding input field.

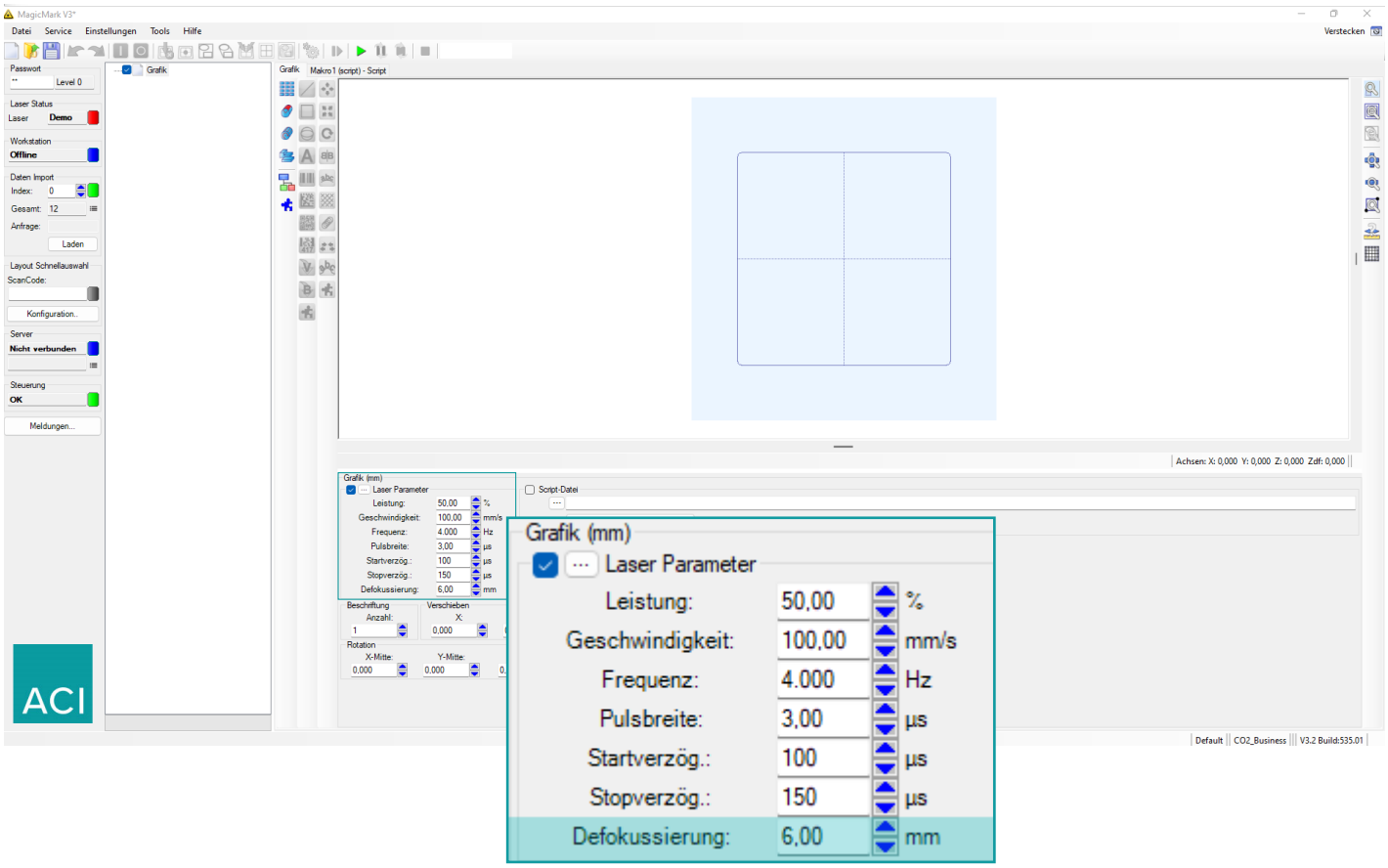


# Defocus

When laser marking certain materials, it is necessary to move the focal plane in order to achieve optimal marking results. The geometric properties of the marking layout are adapted to the actual working plane using the Defocus function. This ensures uniform marking results despite different focal positions. For example, when tempering stainless steel, the focus distance is reduced to prevent unwanted material build-up.

**Key features**

1 Uniform marking results in different focal positions

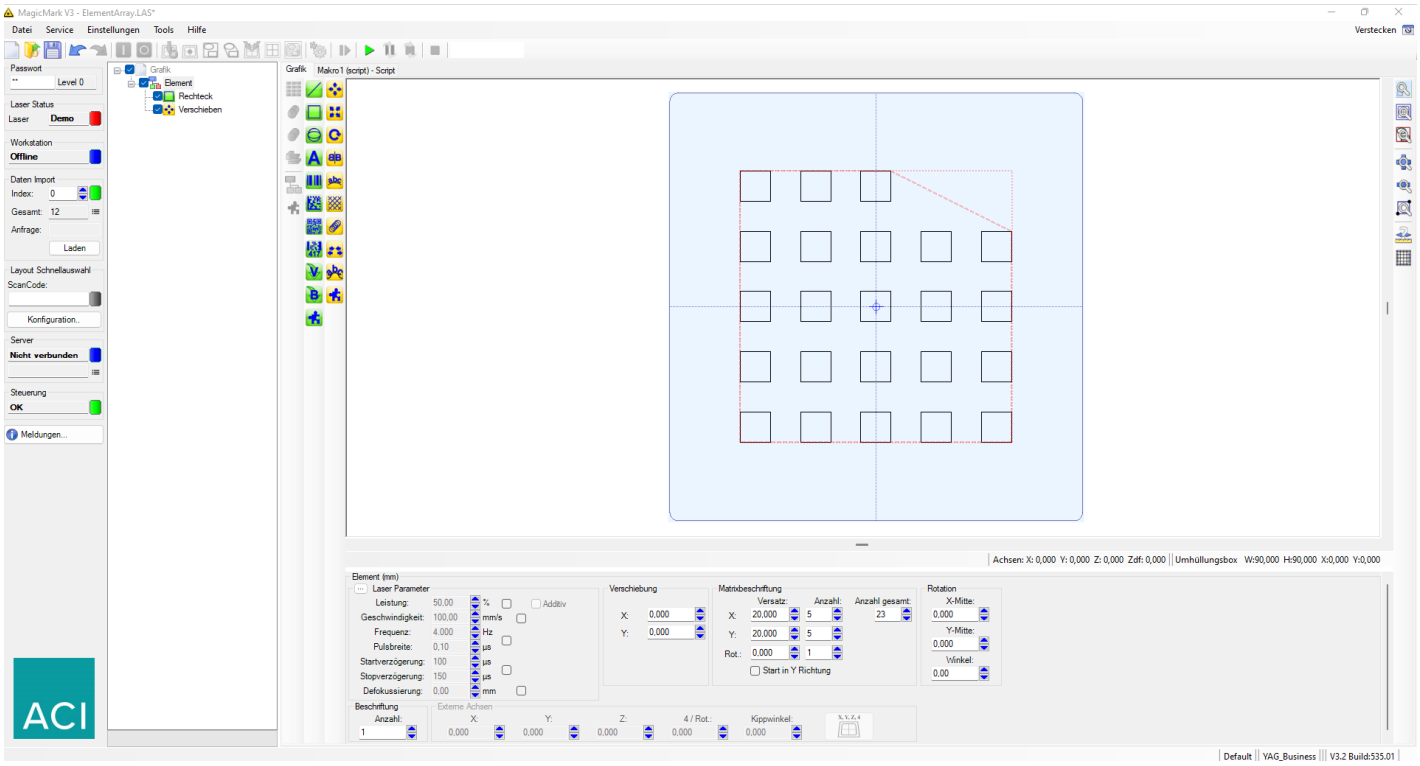


# Array element

A total counter (CountTotal) has been added to the array element. This means that the array elements to be output can now be reduced. If, for example, a 5 x 5 array is created in the element, you can enter e.g. 23 in CountTotal, after which the elements 24 and 25 are no longer output.

**Key features**

1 Time savings from limiting the marking elements



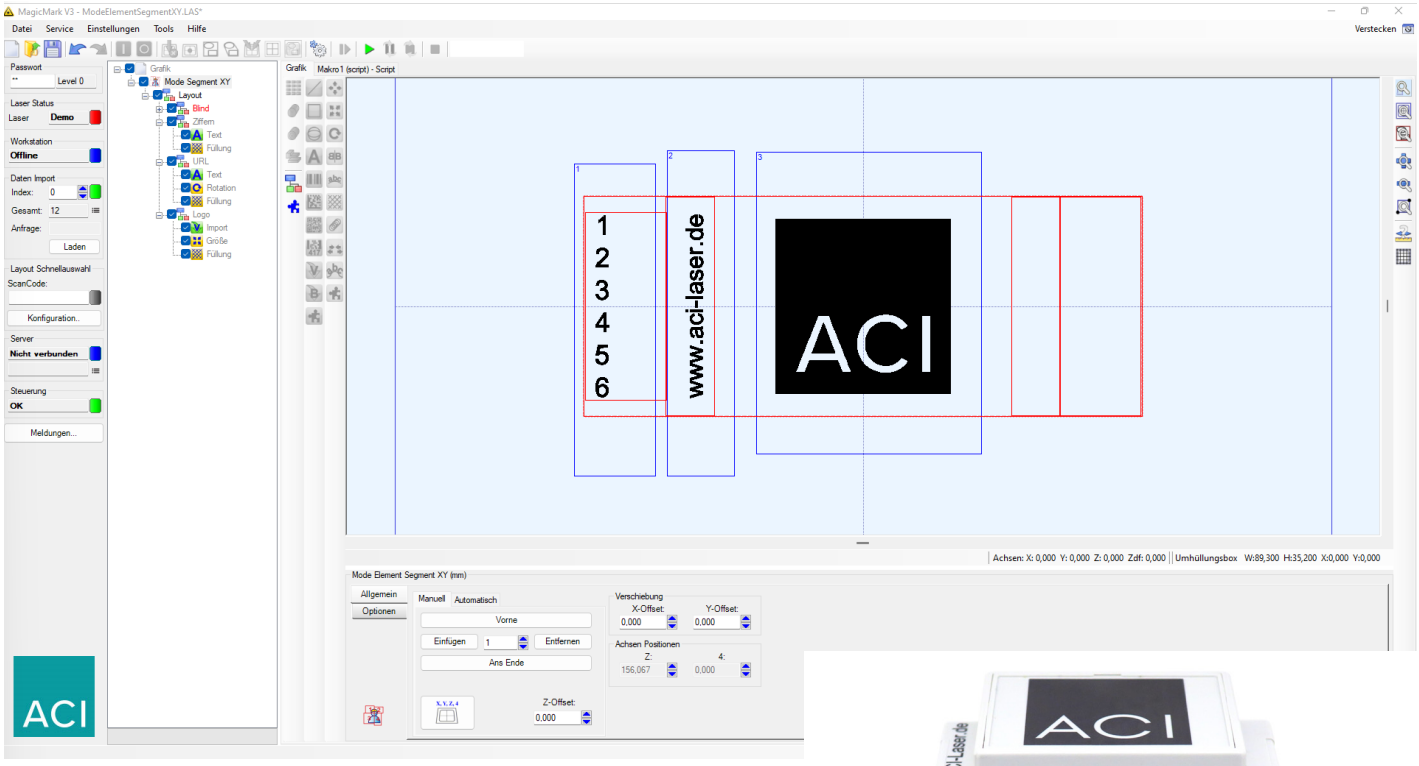
# Mode Element Segment XY

The Mode Element Segment XY allows you to enlarge the scan field according to the current configuration of the laser, the lens used, Workstation and axes. Large objects and layouts can be marked using the segmentation function.

Large marking layouts are broken down into smaller areas, which are then approached one after the other with the XY axes. A z-offset value can also be specified for each segment in the Mode Element Segment XY. This enables objects to be marked at different component heights in a single pass.

**Key features**

1. Magnification of the scan field
2. Uniform marking results on components with different heights




The number and positioning of the segments can be defined by the user


Top-hat rail housing with laser marking at three different component heights


# **Collaborating with ACI Laser**
## Benefits for customers

We prioritise cultivating excellent working relationships with our customers so we can successfully serve their needs. We offer our customers sustainable solutions based on all-encompassing advice, reliability and stability.

ACI Laser is proud to offer:

✓ *German engineering* – development and production drawing on over 20 years' experience

✓ Complete solutions from a single source:
Laser systems, protective housings, software and accessories

✓ Customisable laser systems

✓ Plugins for easy addition of software features

Made in Germany

Laser. Marking. Solutions.


## We would be happy to advise you.

We guarantee you a tailor-made, all-in-one solution that meets the requirements of your application. Our experienced sales team will provide you with comprehensive, in-depth advice. We look forward to hearing from you.



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