



FOBA MarkUS

The intuitive software for laser marking

FOBA MarkUS is an intuitive graphic design and high-performance laser control software for the creation of high-quality and highly precise laser markings. Thanks to the visual user guidance (color codings, flexible and floating toolbars, common icons) MarkUS is an intuitive and easy-to-use software interface.

With MarkUS users not only create great marks, they especially benefit from a range of advantageous, value-adding features:

Your product benefits

- **Intuitive graphic design tools and excellent layout functionalities** for lean and efficient workflows
- **Various marking formats and contents** for ultimate flexibility
- **Built-in grayscale image support** for the convenient creation of astonishing grayscale markings
- **Innovative vision alignment systems** for precision and repeatability: IMP and Point & Shoot
- **Remote control options** for increased automation and productivity (TCP/IP, Profibus, serial communication)
- **Five in one sweep:** support and control of up to 5 axes including a swivel and a rotary axis

At a glance

- **MarkUS Designer:** Easy-to-use GUI for the creation and editing of laser markings, engravings or finishings
- **MarkUS Runtime:** Intuitive user interface and high-performance laser control software for the production of laser markings, engravings or finishings
- **MarkUS Administrator:** System setup and configuration
- **Freely configurable user levels:** Operator for running production jobs (Runtime), Job designer for job creation and job setup (Designer), Administrator for system configuration

*MarkUS Designer (left) and
Runtime (right) user interfaces*





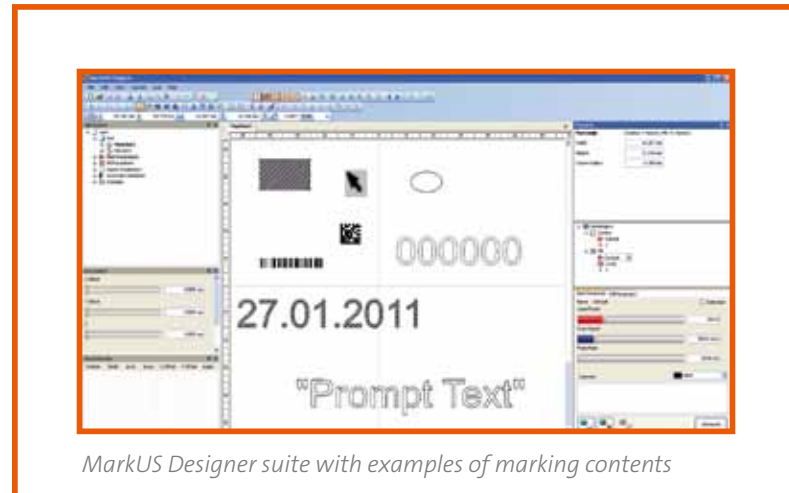
Ultimate usability: MarkUS user interfaces

MarkUS Designer The designer interface

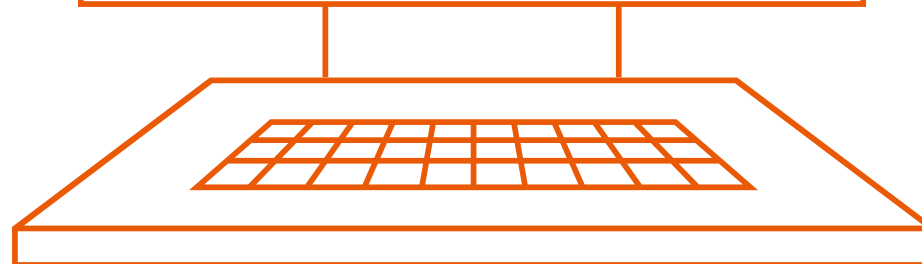
The Designer Suite is used to create and edit templates and jobs for astonishing laser markings; and for job setup – such as the laser parameter setup.

MarkUS Designer intuitively and visually guides the user thanks to color codings, floating toolbars and the use of common icons. Excellent layout and import functionalities include a wide range of marking formats, advanced text editing, several graphic import filters, easy mark multiplication, virtual marking fields and many more design features.

- **User level:** Job designer
- **Main Areas:** Dropdown menus and floating toolbars, preview and design area, properties, job explorer, axis control, status and hardware control



MarkUS Designer suite with examples of marking contents



Unique feature: Radial segmentation

Whether it is text or logo, the segmentation feature built-in MarkUS allows users to easily and quickly mark cylindrical components. MarkUS will accommodate marking on the inner (ID) or outer diameter (OD) of a cylinder. FOBA's technical approach of radial segmentation overcomes the limited depth of focus of lasers as well as the inherent distortion associated with marking on radial surfaces. With MarkUS' innovative approach to segmentation the mark is just perfect.



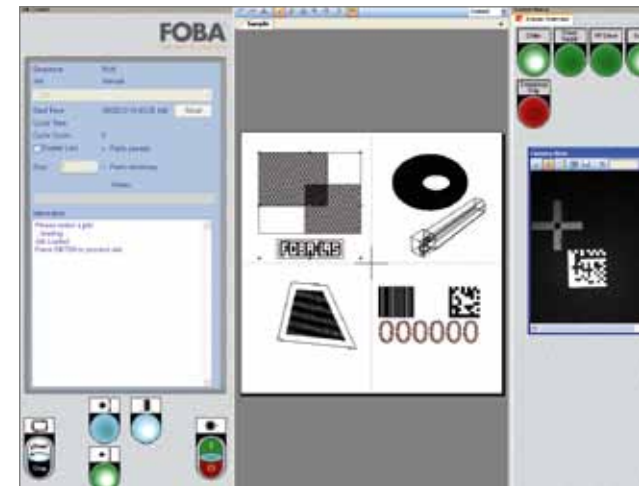
MarkUS Runtime The operator interface

Runtime is used to run production jobs and provides all important status information on both machine and marking jobs.

Runtime is MarkUS' intuitive operator interface and high-performance laser control software. It is especially easy-to-use as it comes with the same controls as the laser marking system or machine.

For customers that require specific operating processes as well as custom graphical user interfaces, MarkUS provides means of customizing the Runtime. The Runtime can be modified, via plug-ins, to create interfaces that meet specific requirements. Customers can either develop their proprietary interface or call upon FOBA to do so.

- **User level:** Operator
- **Functionalities:** Load, start/stop jobs (job control panel and job preview area), control the laser system (system status panel)



Standard MarkUS Runtime interface



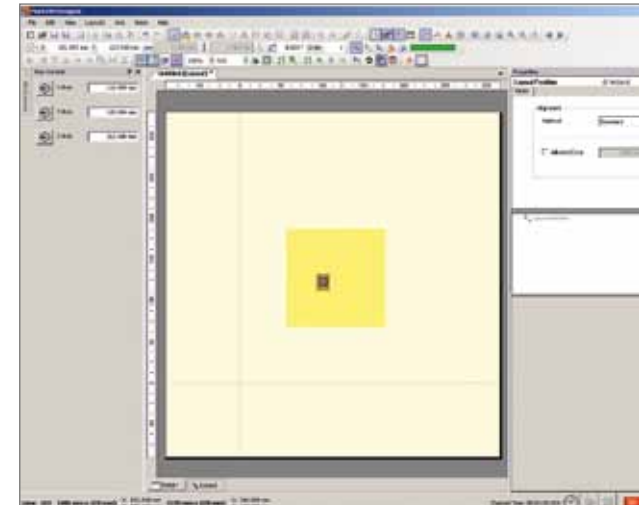
Custom MarkUS Runtime interface

Unique feature: Virtual marking field

The virtual marking field displays the maximum available marking field.

By using a view of the virtual marking field – the result of the combination of axis movement and the physical marking field –, users can easily create complex marking jobs in a matter of minutes.

The square physical (yellow) and virtual (beige) rectangular marking fields





For precision and repeatability: Innovative vision alignment features

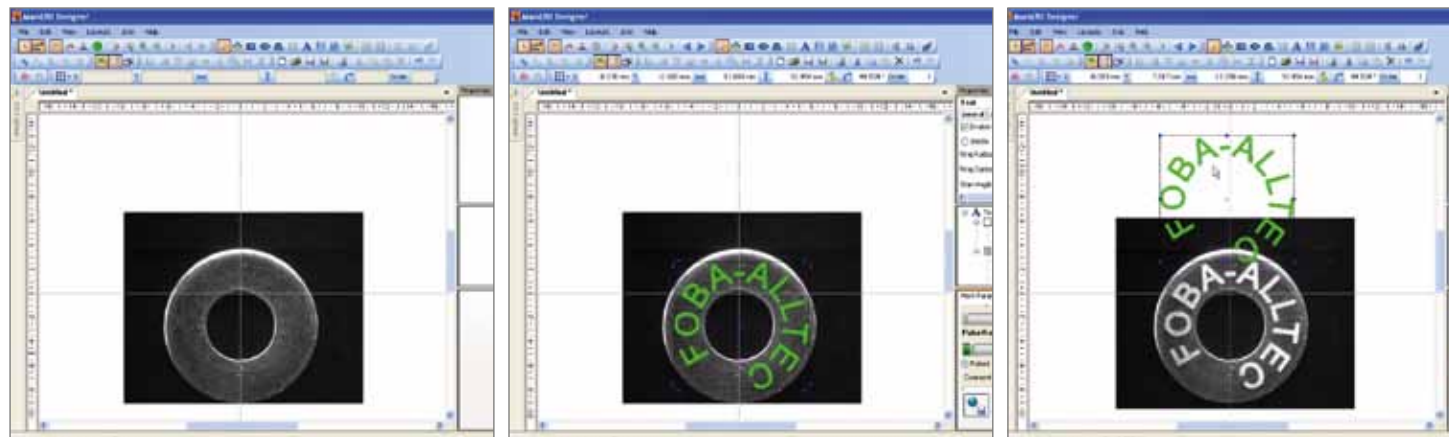
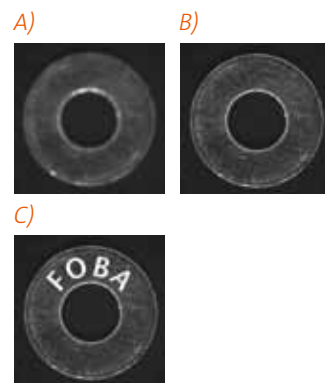
The vision systems IMP (Intelligent Mark Positioning) and Point & Shoot ensure ultimate precision and repeatability. With Point & Shoot marking contents are placed manually directly on a screen image of the product to be marked. This system is perfect for the processing of high-quality work pieces and individual parts. The patented camera system IMP automatically detects work pieces and their positioning, and adjusts the marking/engraving accordingly. That is why IMP is ideal for automated batch production.

Vision alignment with Point & Shoot

The innovative vision tool option, Point & Shoot, is a powerful feature for manual mark positioning. Point & Shoot is fully integrated within the Designer tool, it eliminates the lengthy phases of trial-and-error. This exceptional vision tool also allows users to create marking jobs from existing pre-marked parts, eliminating the need for part drawings and completing the job within minutes.

Point & Shoot is a WYSIWYG tool that helps reduce fixtures and fixture related costs, significantly curtails time consuming trial-and-error processes, and ensures upfront verification of what the mark will look like and where it will be applied.

Practical add-on: The Point & Shoot camera image can also be used for focusing:
A) Blurry/not focused correctly
B) Focused correctly
C) Marked perfectly

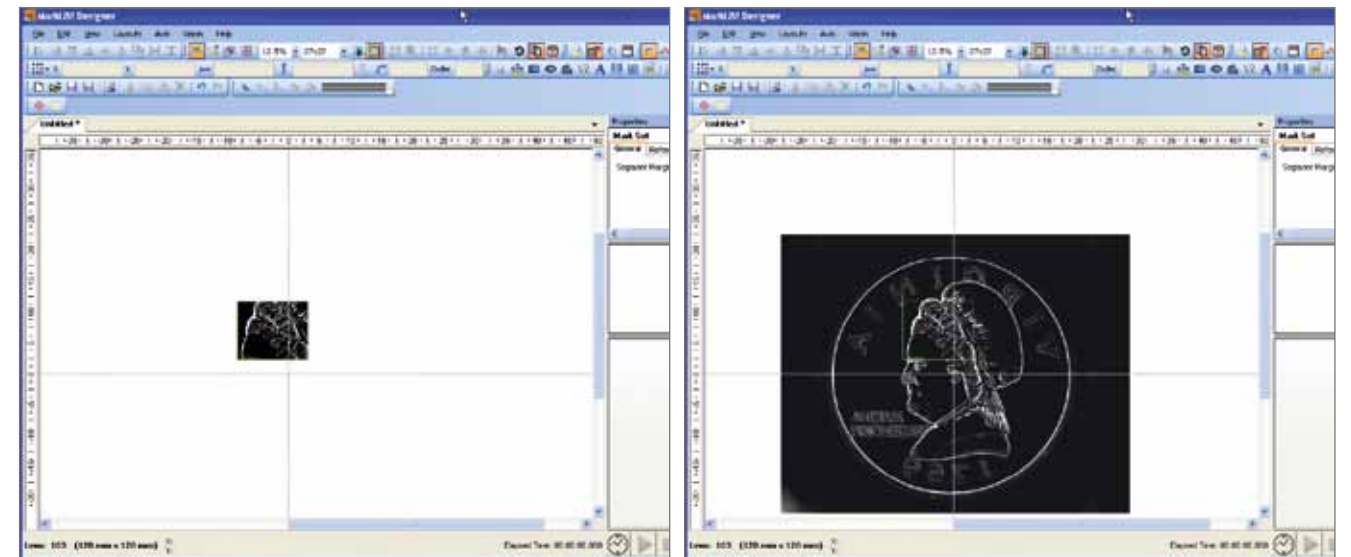


Part in place

Mark content aligned manually

Part marked accordingly

The Point & Shoot camera focuses (through the lens) on the marking field*, creates an image of the part, and displays it on the screen. The user creates the marking and places it (via drag & drop) where it should be applied on the product. (* The visual field of the camera depends on the configuration of the laser optics used.)



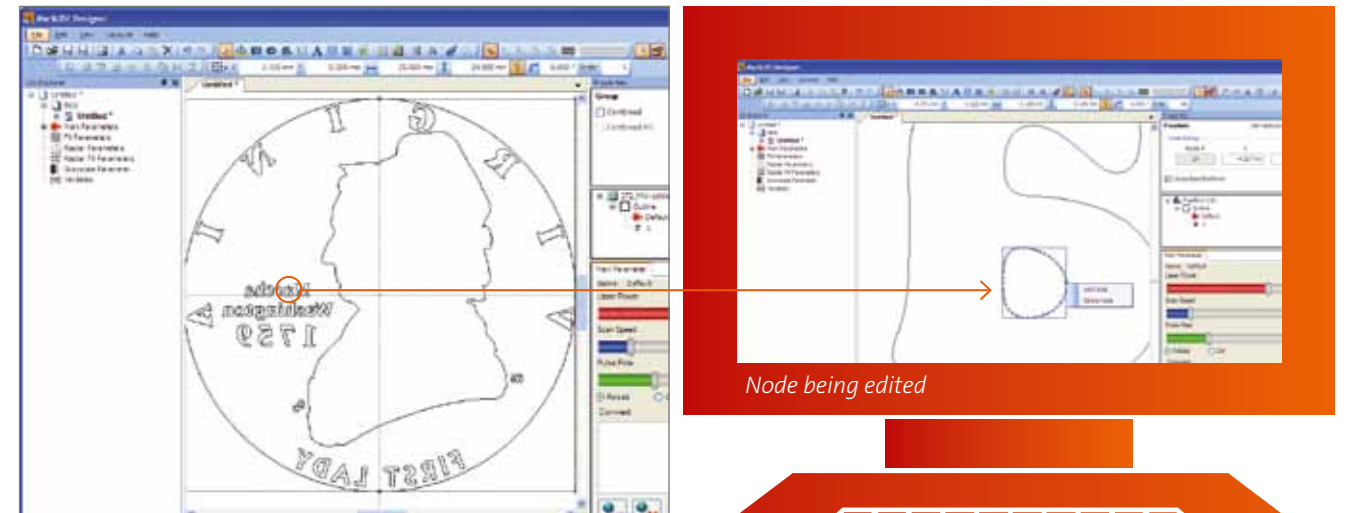
Single live image (green)

MarkUS tiled images with a floating live image (green = camera image size)

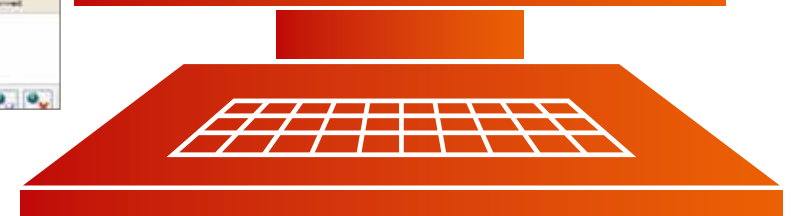
Image tiling and node editing

Image tiling: The Point & Shoot and IMP features have been taken to its next level of simplicity and user friendliness. MarkUS users are now able to stitch multiple view images from the live camera to create an accurate and highly detailed tiled image of the physical mark field. Image tiling is ideal when training large trays or large objects.

Node editing: Imported mark contents do not always match the part to mark. In some circumstances a quick edit of the contours can get mark contents to match perfectly the part. MarkUS provides means of editing the shape of imported contours to the node level by providing tools to move, add or delete nodes as needed.



Node being edited

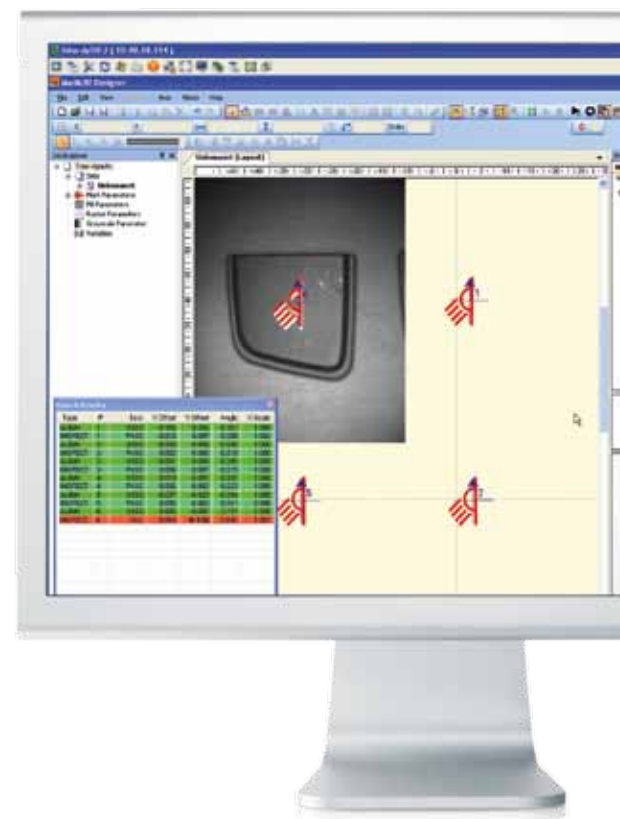




Patented and proven for ultimate precision and repeatability: Vision alignment with IMP (Intelligent Mark Positioning)

Upgrade from Point & Shoot to IMP to ensure ultimate precision and repeatability for automated batch production. The patented camera system IMP automatically detects work pieces and their positioning, and adjusts the marking/engraving accordingly which makes it ideal for automated batch production.

- **Reduction of scrap and mismarked parts through vision alignment:** Elimination of the wrong mark on the wrong part by visually verifying the proper part geometry prior to marking; should this part validation fail, the part is not marked; an error message is written, communicating the failure to the user.
- **Automatic mark alignment:** Users from different markets are bound to strictly comply to defined processes, particularly if the mark position accuracy has a significant added value. The IMP vision alignment system validates the part integrity, measures its position and automatically aligns the marking relative to the part.
- **Automatic mark verification:** With its verification feature, IMP provides the capability to achieve pre-mark and/or post-mark verifications. The pre-mark verification feature prevents over marking already marked parts. The post-mark verification validates that the mark placement is accurate. This feature also helps check for poor contrast marks that can be caused by an early degradation of the laser performance or a change in material characteristics.

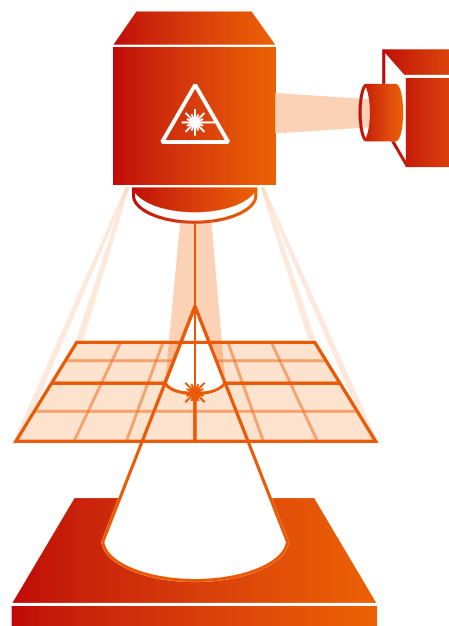


Verification report:
The last failed inspection as the
Y position exceeded the 0.1mm
tolerance.

→ IMP (camera system)

The patented IMP vision alignment system, proven and tested in over one hundred installations, detects the positioning of areas and components to be processed, and adjusts the engraving, frosting or marking precisely as required. Added value:

- + Exceptionally suited for automated serial processing
- + Consistently highest processing quality
- + Faster finishing
- + Improved accuracy
- + Increased efficiency
- + Increased productivity
- + Drastically reduced scrap

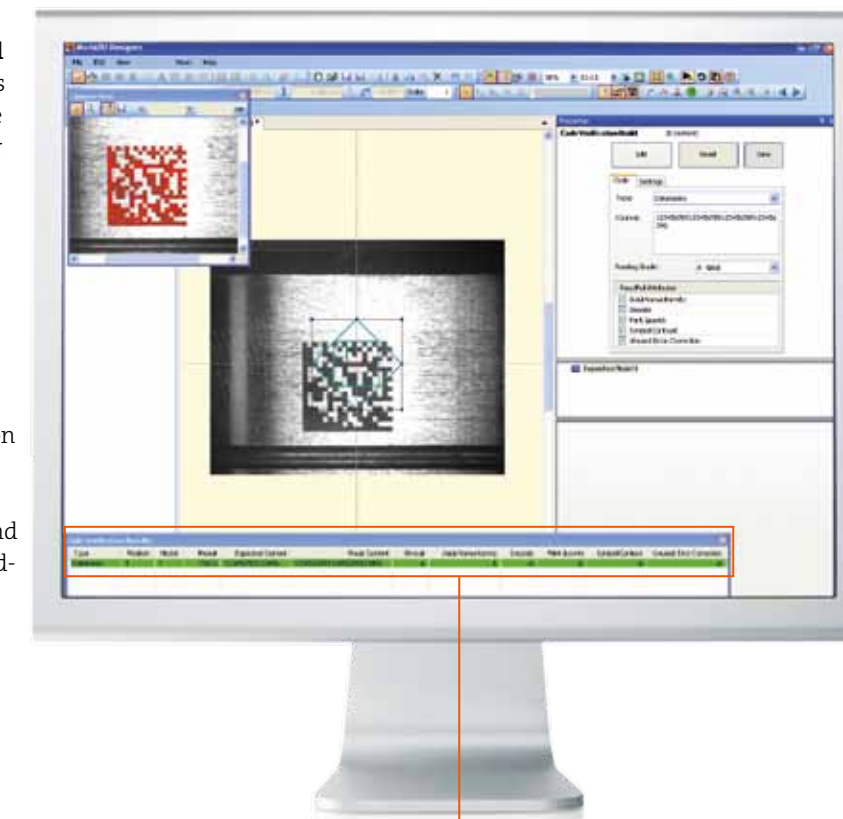


Read and verify: With MarkUS' barcode feature

As an addition to the Point & Shoot feature and IMP, MarkUS provides the ability to **read barcodes**. Serial barcodes, as well as 2D codes such as the QR and Datamatrix codes, can be read and validated a fraction of second after being marked.

The barcode reading feature provides the unique flexibility to read codes within the marking field.

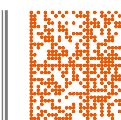
This new feature offers the ability to **run multiple products on the same production line** without the need to physically reposition the camera. The scan head galvos overcome the limitation of a rigidly mounted external camera. This represents a significant time and cost saving when running mixed model production lines.



BC128



ECC200



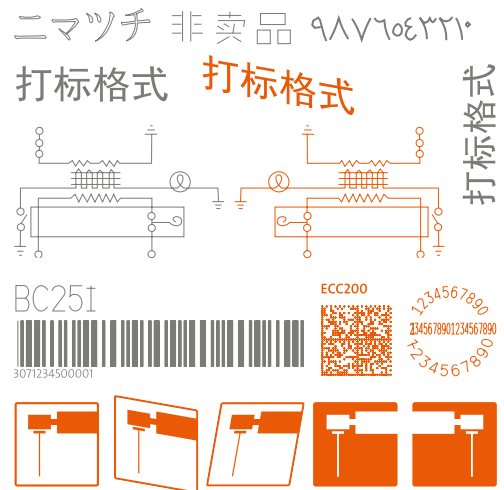
The barcode reading option comes with a **verification tool** that provides means of passing or failing codes based on different factors such as the read content or the mark contrast.

The code verification results from a datamatrix code read-out that validates the mark content.

Type	Position	Model	Result	Expected Content	Read Content	Overall	Axial Nonuniformity	Decode	Pure Growth	Symbol Contrast	Unused Error Correction
Datamatrix	1	1	PASS	123456789123456	123456789123456	A	A	A	A	A	A

For ultimate flexibility: Various marking formats

- Multiple language fonts
- Machine-readable codes (bar codes, 2D and QR codes)
- Graphics/graphic components, logos, symbols, etc. (the most common formats can be imported)
- Grayscale images and contents
- Complex fillings (hatch, contour and meander)
- Linear, circular and angular text marking; ring writing, rotation, reflection, expansion, compression, horizontal and vertical stretching of marking contents and texts
- Sequence and serial numbering; automatic date, layer, time coding, real-time clock; online coding of individual data



FOBA MarkUS Technical Data

Standard features

Interfaces

MarkUS Designer, MarkUS Runtime, MarkUS Administrator

Axis control*

Support for up to 5 axes (X, Y, Z, rotary axis and swivel axis)

Radial segmentation*

Marking (texts, logos) on the circumference of cylindrical objects (rings, jewelry; arced, concave, convex). Allows the laser to maintain focus to the surface while marking and minimizing distortion caused by the surface curvature.

Grayscale support*

Layout, design, editing of grayscale marking contents, e.g. graphics, images

File support

Import functions for the most common file formats: BMP, JPEG, TIFF, HPGL, FOBA's proprietary MCL, AI (up to 10 except 9, CS1, CS2, CS3 [without text objects], compressed/binary/PDF not supported), DXF (up to V11)

Supported lasers

IR, UV, CO₂

Options

Point & Shoot

WYSIWYG camera system for visual direct mark alignment on a screen image of the part (hardware is included, one USB port is required). Image tiling is included.

Intelligent Mark Positioning (IMP)

WYSIWYG vision system for the precise position detection of parts/to-be-processed areas and automatic alignment of marking, engraving or finishing (hardware is included, two USB ports are required). Pre and post mark verification is included. Post mark verification will pass fail on mark position, orientation and scale.

Barcode reading

Datamatrix (ECC200), QR-Code, BC128 A/B/C, BC39

Remote access

TCP/IP, Profibus or serial communication

Language support

Chinese, Czech, English, French, German, Hungarian, Italian, Japanese, Polish, Portuguese, Romanian, Russian, Spanish, Swedish

* Needs additional and/or special hardware

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