



WISEWELDING

Machine vision system for automatic path adaptation in welding production





Wise Welding

Robotic welding introduces many advantages to the manufacturing process: smooth movements, speed, precision, flexibility, continuous operation even under harsh industrial conditions.

Movement of the welding robot is generally determined on the so called "reference product". The process is called "learning the reference geometry". Product welding is logically divided into several welding paths. Each welding path is determined in the strategic points along the joint.

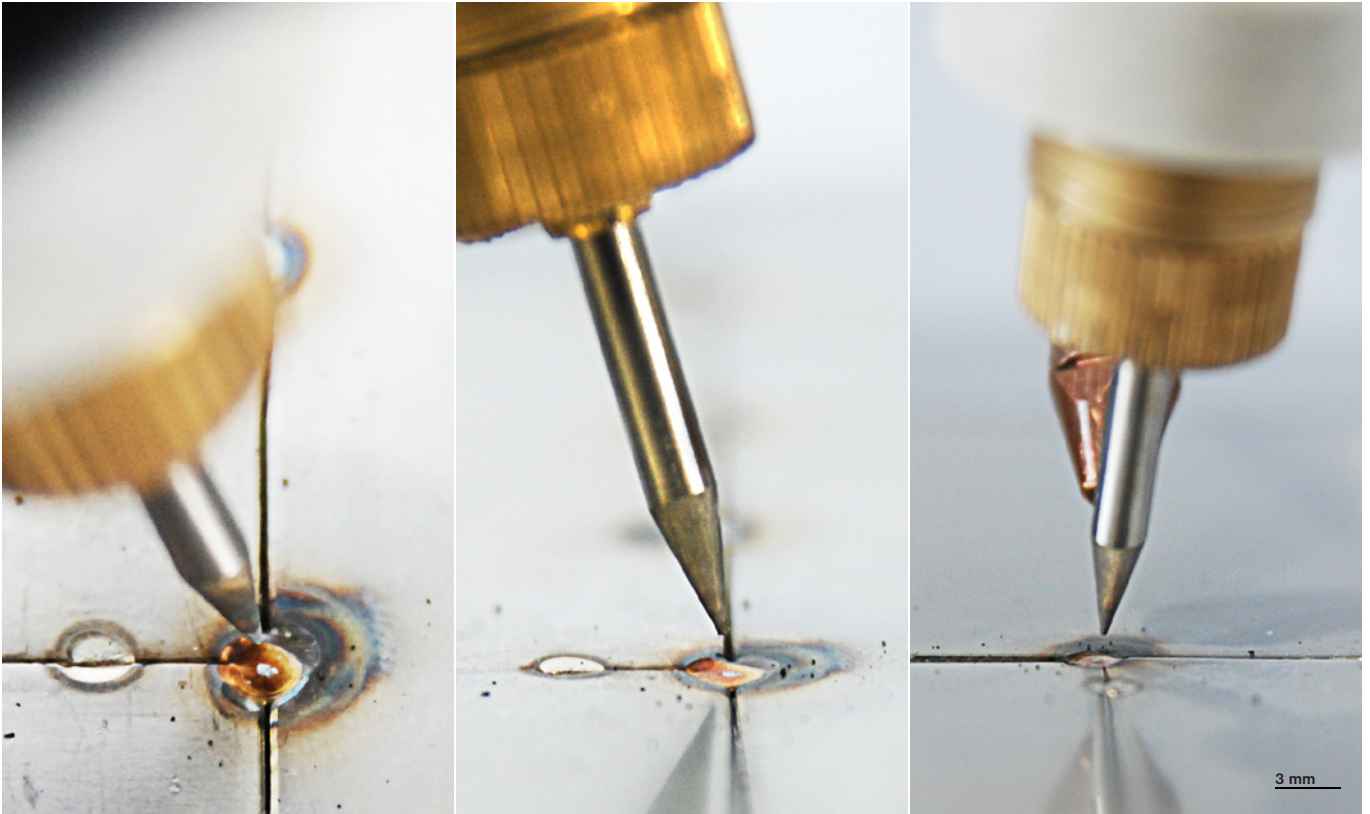
In practice, the geometries of the same products still diverge to some extent. Robotic welding paths are therefore in need of adjustment to the actual seam course on a product.

Correction can be conducted manually by the operator. A step-by-step execution of robotic welding program takes place before welding. For each path point the operator visually examines adequacy of the welding torch tip position and adjusts it if necessary. This approach is time-consuming, repetitive, and prone to human error due to subjective assessment.

Much better than manual is automatic correction of robotic movement to the actual product geometry. It can be achieved using Wise Welding system. Wise Welding system enables precise, objective and a few times (~10×) faster welding path corrections when compared to manual operation.

Wise Welding advantages:

- Rapid new product geometry adaptation
- Simplicity and user-friendliness
- Flexibility and utilization of equipment
- Increased productivity
- Rapid return on investment



Attained precision guidance of a Wise Welding system

System

Wise Welding system consists of an imaging module and a processing unit. Imaging module is placed in front of the welding torch and linked to the processing unit. The latter is connected to the robot controller.

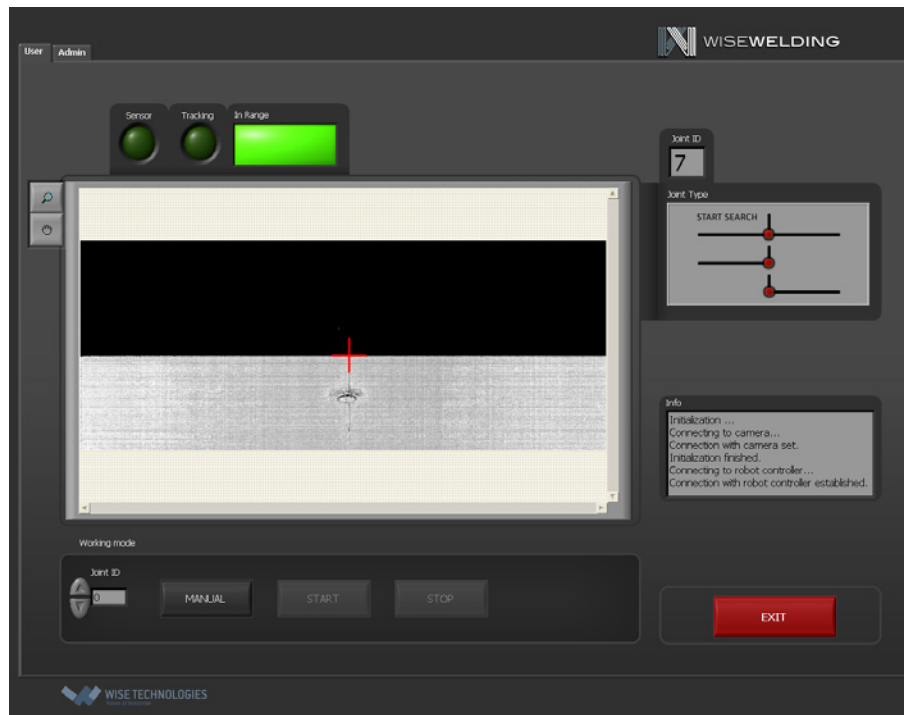
The next step is learning the reference geometry of the product, for which Wise Welding system is used. Learning is similar to the manual work learning described above. The main difference is that here learning takes place ONLY ONCE. The entire learning process is carried out by a robotic interface. The system is now ready for automatic welding of the learned type of product.

Wise Welding enables standard joint path adaptation: butt, V-shaped butt, overlapping, and corner joint. System is, furthermore, adaptable to special joint types. It enables joint finding, joint tracking and welding, de-

pending on production strategy. Each of the approaches has its advantages and selecting the most suitable is usually subject to technology used in the production process.

Prior to integration, it is recommended to assess the complexity of the target product and coordinate user requirements. On this basis, we can adjust the speed, precision, working range and imaging system space constraints to provide an optimal price-performance ratio.

Quick adjustments are enabled by a modular hardware and software base in association with a high-level development environment.



Wise Welding user interface

Using the latest imaging technology ensures higher resolution and dynamics. At the same time it enables high quality acquisition of surface's key properties for a robust operation on "black" and stainless steel, matte or polished, regardless of scratches, irregularities, on the contact of a differently treated surfaces (e.g. matte and polished), with gapless butt joints without mismatch, in the presence of variable ambient conditions and in the immediate vicinity of the arc radiation.

Operation in any industrial environment certainly calls for adequate protection. Mechanical protection is assured with design and allows for the replacing of consumable parts, such as glass protection of optical elements. HF electromagnetic interference (EMI) protection class is guaranteed even for TIG welding.

More on www.wise-t.com:

For more information about the Wise Welding product, references and other products, please visit Wise Technologies website.

Reference:

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