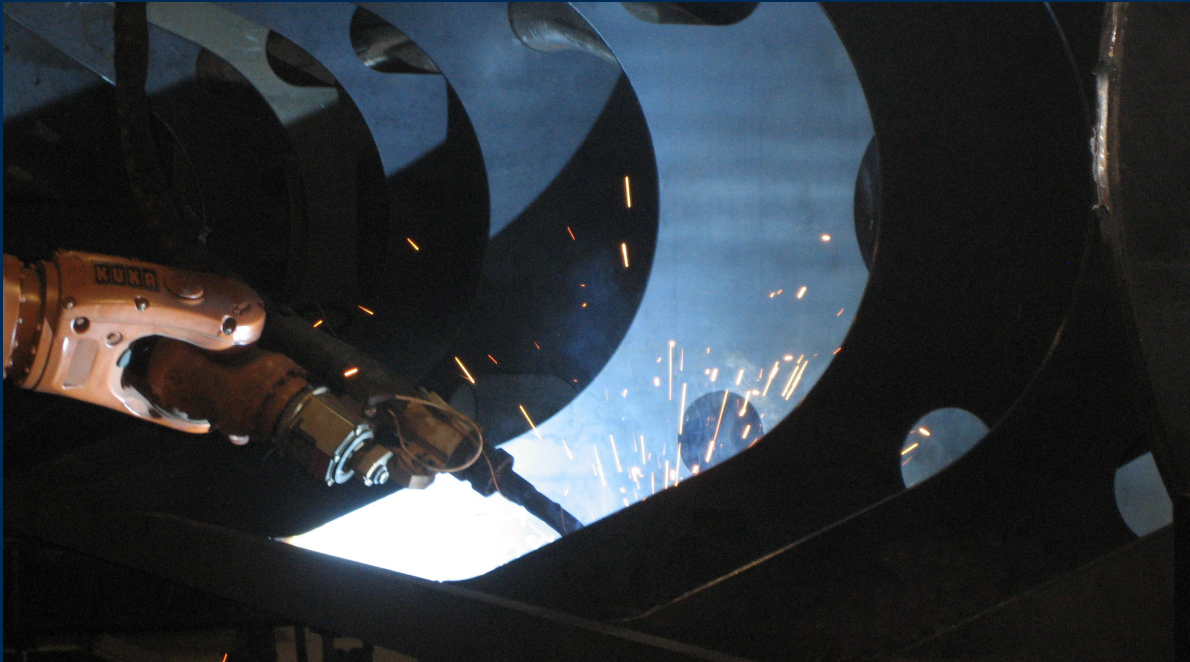


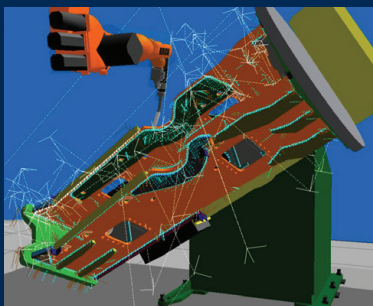
SmartTCP

Automatic Welding

FOR SMALL BATCH PRODUCTION



SmartTCP makes industrial robots smart and knowledgeable



SmartTCP Automatic Welding solution for fabrications in small batch production reduces the need for expert welders, improves time to market, and increases production volume and quality. The gantry welding system is a turnkey solution that automates both the robot programming and the weld production and includes the hardware, software, installation, training and support during and after implementation, making it possible for job-shops and manufacturers to optimize the fabrication of high mix low volume parts.

www.smarttcp.com

THE CHALLENGE

AUTOMATIC WELDING FOR SMALL BATCH PRODUCTION

Large or complex metal products in construction and heavy industries are fabricated partially by semi-automatic welding machines and largely by the intensive labor of expert welders. Robots are designed to carry out tasks that would otherwise be difficult or dangerous for expert welders, but widespread use of welding automation is currently implemented only for simple and repetitive fabrication. Robotic welding for one-off and small batch production barely exists because programming for this type of production is both complex and extremely time consuming; this has made production automation uneconomical and therefore irrelevant.

THE SOLUTION

A TECHNOLOGICAL BREAKTHROUGH

SmartTCP presents an intelligent, robotic welding solution for small batch fabrications. A predefined three dimensional working envelope, SmartTCP can weld any large or complex assembly that fits within the working envelope, first time seen, in a short time. It is a modular, flexible and automatic off-the-shelf manufacturing solution that can be implemented in a wide range of manufacturing applications after a short setup.

OUR PROMISE

LOW COST FABRICATION OF HIGH MIX LOW VOLUME PARTS

SmartTCP turnkey solution can weld any weldable, large or complex assembly that fits within the predefined three dimensional working envelope, even if it is the "first time seen". SmartTCP is a reliable off-the-shelf solution that can

be installed and implemented into production in a very short time. The system is easy to use and

can be programmed and operated by the same expert welder. It is an affordable solution with a quick return on investment.



SmartTCP Automatic Welding

A typical SmartTCP Automatic Welding Cell, welding heavy equipment Compactor. The system includes: articulate robot, three axes gantry, head & tail positioner, 2 axes positioner, welding power and controllers.

KEY BENEFITS

Reliability: The SmartTCP solution is built with existing, reputable off-the-shelf hardware systems.

Flexibility: The short teaching cycle enables short run, flexible production, which increases the variety of products' output, assists in managing inventories and improves time to market.

Lower costs: Maximize the productivity and cost efficiency of your welding operation.

Rapid implementation: The system is easy to use and has a short learning curve.

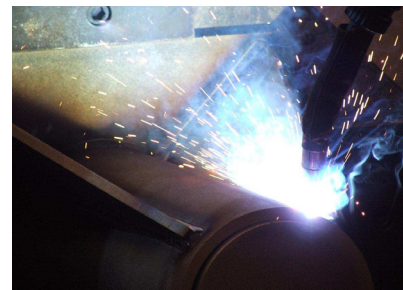
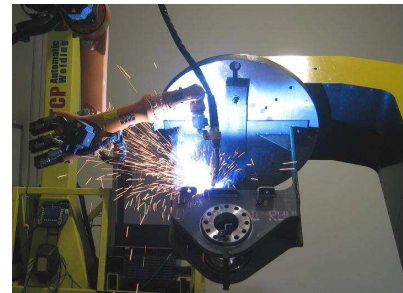
Speed: Decrease production time by reducing time consuming robot teaching. This increased efficiency opens doors to new lines of business.

Increased quality and reliability by implementing a knowledge base. Production is based on ongoing accumulated knowledge and performed repeatedly and consistently at high quality, independent of human imperfection and task complexity

Reduced dependency on an expert arc-welding staff. Setup and ongoing maintenance of the knowledge base is performed by an expert engineer, but ongoing robot teaching can be performed by less qualified staff.

SOLUTION HIGHLIGHTS

- Automatic ordering
- Automatic via path between welds
- TCP reachability without any robot configuration constraints
- Working envelope can be expanded/decreased at any time
- Automatic seam type creation based on geometry and master topology
- Automatic robot welding behavior based on geometry and master topology
- Automatic teaching of complex multi-axes manufacturing environment, robot and externals (in complex workpieces it can go up to 12 axes)
- Comprehensive set of manual tools for deleting, editing or new creates of seam type, weld type, via path, ordering and teaching
- Automatic scheduling of all seven automatic operations mentioned above
- Automatic control on all other NC components (welding equipment, calibration, searching, inspection or vision)
- Modular, three dimensional working envelope built with standard off-the-shelf manufacturing systems
- Automatic toolpath creation of unlimited number of seams in complex geometries
- Set of flexible simulation tools for close inspection and analysis
- Clear log indication of local failed operation and tools to fix them

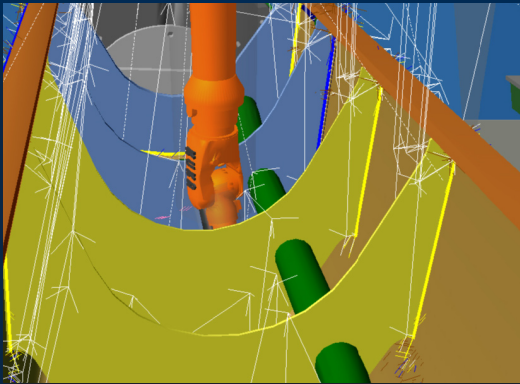


TURN WELDING ROBOTS INTO NEXT GENERATION SMART MACHINES

SmartTCP software analyzes target geometry and teaches the system to look at the task through the eyes of an expert welder. It creates accurate and reliable robot programming, up to 100 times faster than either on-line or off-line programming techniques.

Import 3D CAD approximation data of the welding assembly model into the SmartTCP system and it will automatically create a program file containing all the potential welding geometries and implement a predefined master technology of welding paths, via paths, robot configurations, and welding technologies. The program file is then downloaded to the robot controller for execution.

From virtual model to welding sparks in short time



SmartTCP's hardware is built from widely available off-the-shelf third parties' "Autonomous Manufacturing Systems" that are assembled into a flexible and modular working envelope, ready to weld any weldable workpiece. Our revolutionary software automates complex and tedious robot programming tasks.

SmartTCP

Automatic Welding

in collaboration with:



GÜDEL



KUKA