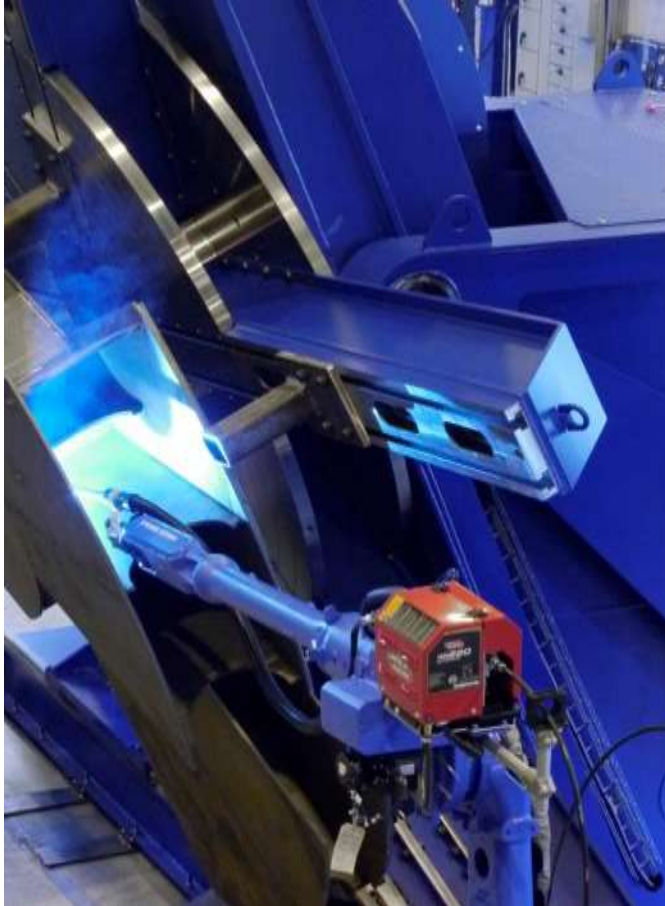




Robotized One-Off Production Solutions -WeldControl 300 Offline- Pemamek Oy Ltd

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One-Off Production Solutions – What Makes It Possible?



- Ability to do quick set up of a new product to the production
- Possibility to forecast and anticipate production
- It must be profitable
- Conventional ON-line programming method does not do it
 - Off-line programming must be implemented
 - Pema has solutions available to various requirements

Pema WeldControl Product Family for Robotized Welding

- WeldControl 200 series for programming of in place work pieces
 - Shipbuilding solutions, panel structures
- WeldControl 300 series for programming of manipulated work pieces
 - Any product



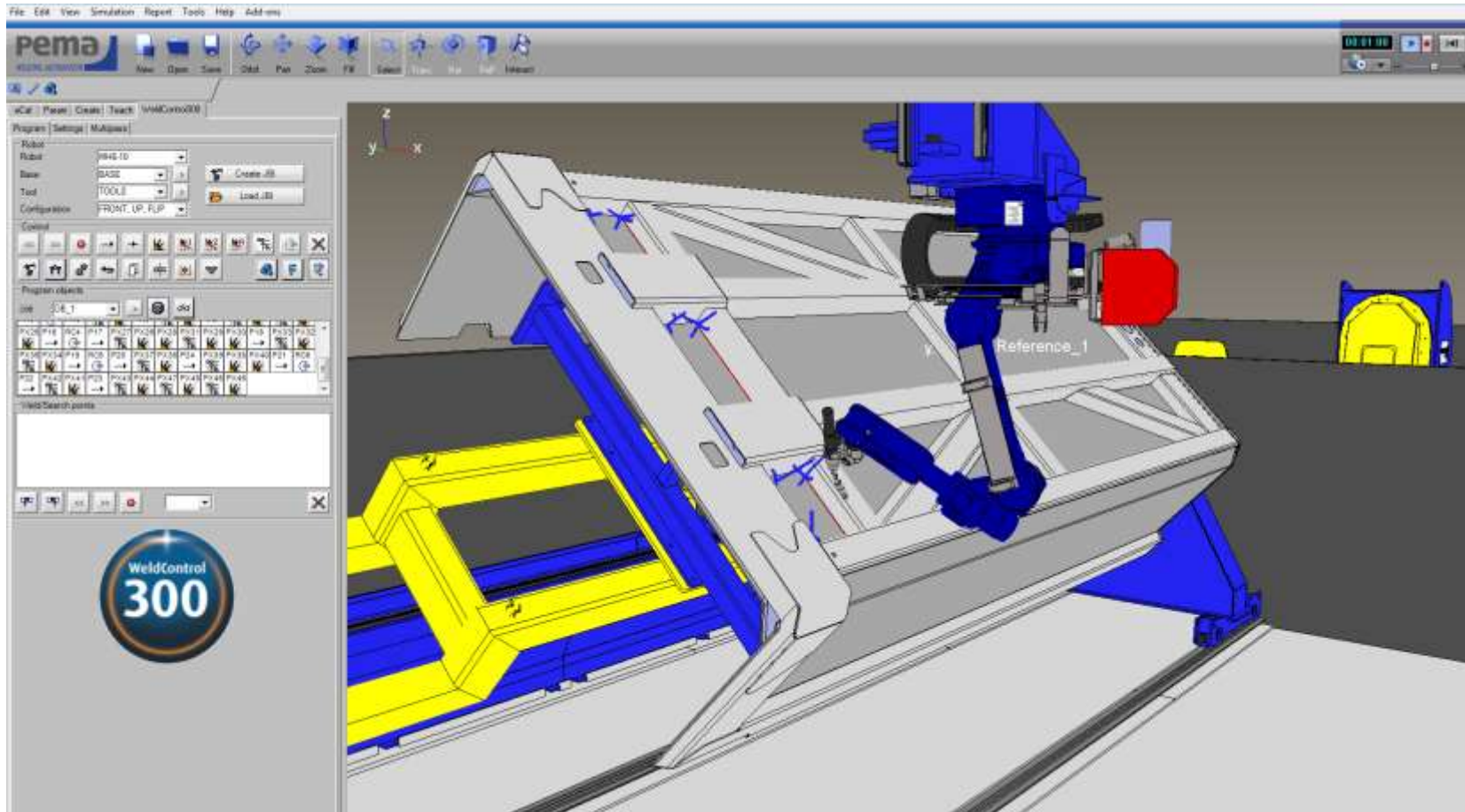
Vision
Create
Scan



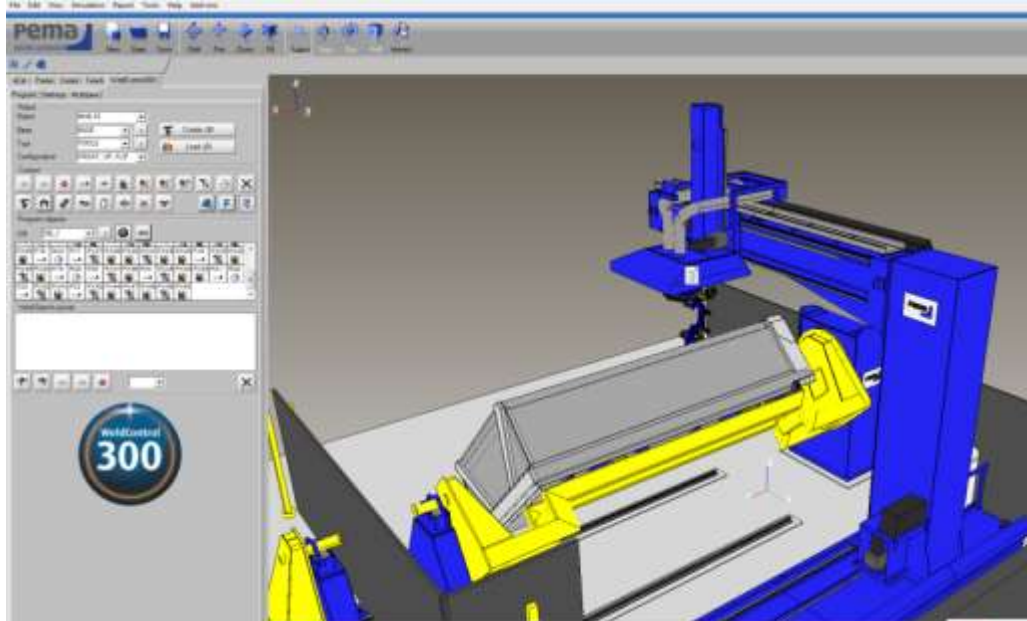
Offline
Create
Scan

Solution to Needs of One-off Production

PEMA WELDCONTROL 300 OFFLINE



WeldControl 300 Offline – Use



- Off-line programming of robot welding programs
- Especially for work pieces that need to be manipulated with a positioner
- From one-off to mass production
- For bidding purposes
- As a Design For Manufacturing and fixture design aid

WeldControl 300 Offline – Benefits



- The most flexible way to produce robotic welds!
- Easy user interface
- Fast & provides high program quality
 - Multiple robot path points are created with one selection – “primitives”
 - Minimized “touch up” time needed on the shop floor
- Programming time taken off from the robot station – increased capacity

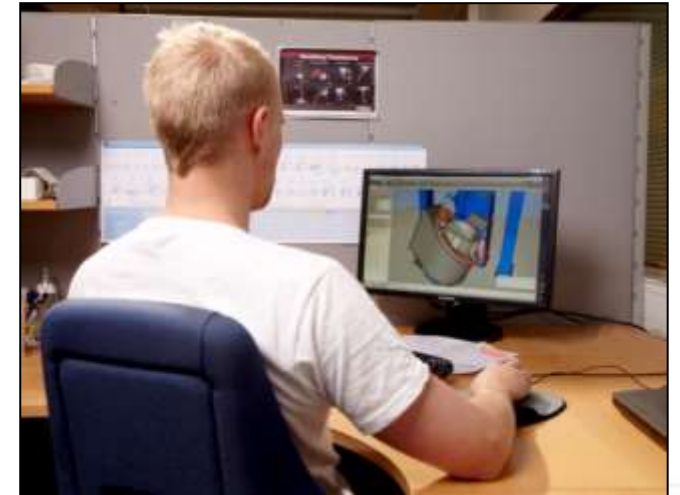
WeldControl 300 Offline – Work pieces

- Any work piece which is weldable with a robot
- 80/20 rule – 80 % welded with 20 % of programming effort - feasibility
- For large and difficult to access – work pieces
 - Improvement in HSE
- For work pieces that contain curved grooves
 - Optimised manipulator movements in synchronization with the robot



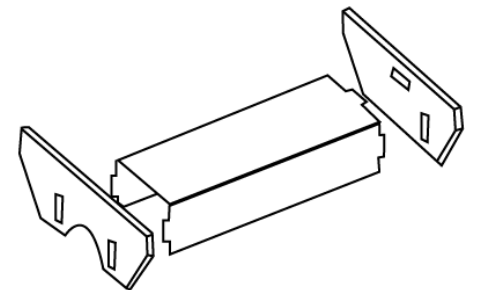
WeldControl 300 Offline – Experiences

- “Two times faster to make robot programs than with competing software!” -User
- ON-line programming time \neq OFF-line programming time
 - Can be 10 times less
- No programmer handprints – homogeneous programs
- Helps to sort out which products are feasible to weld with robot



WeldControl 300 Offline – Requirements

- You are safe to implement the Offline programming if following things are OK
 - Pre-fabrication is updated for robot welding process requirements
 - Cutting accuracy is high enough (most cutting processes made with CNC)
 - Part assembly is accurate – helping features such as self fixturing tabs and slots
 - Tack and root welds are suitable for robot welding
 - Accessibility to weld seams is good (space for robot arm + torch)
 - Simple and accurate welding fixture for the work piece
 - Good quality 3D models available – lots of different readers



WeldControl 300 Offline – Applications

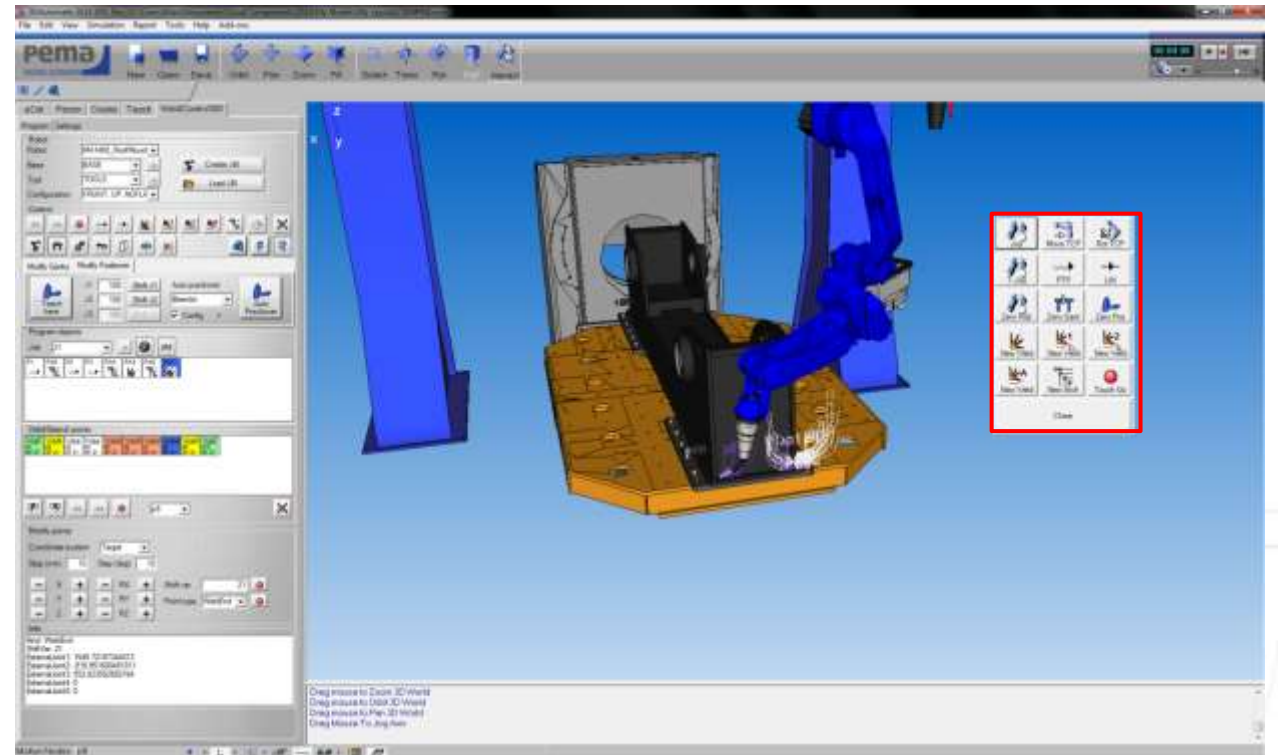


MANTSINEN Group Oy

- Upper bodies of material handlers up to 30 tn weight
- ~200 kg welding wire / body
- Plate thicknesses 15 – 50 mm
- Shorter delivery times, less excess welding and improvements in HSE

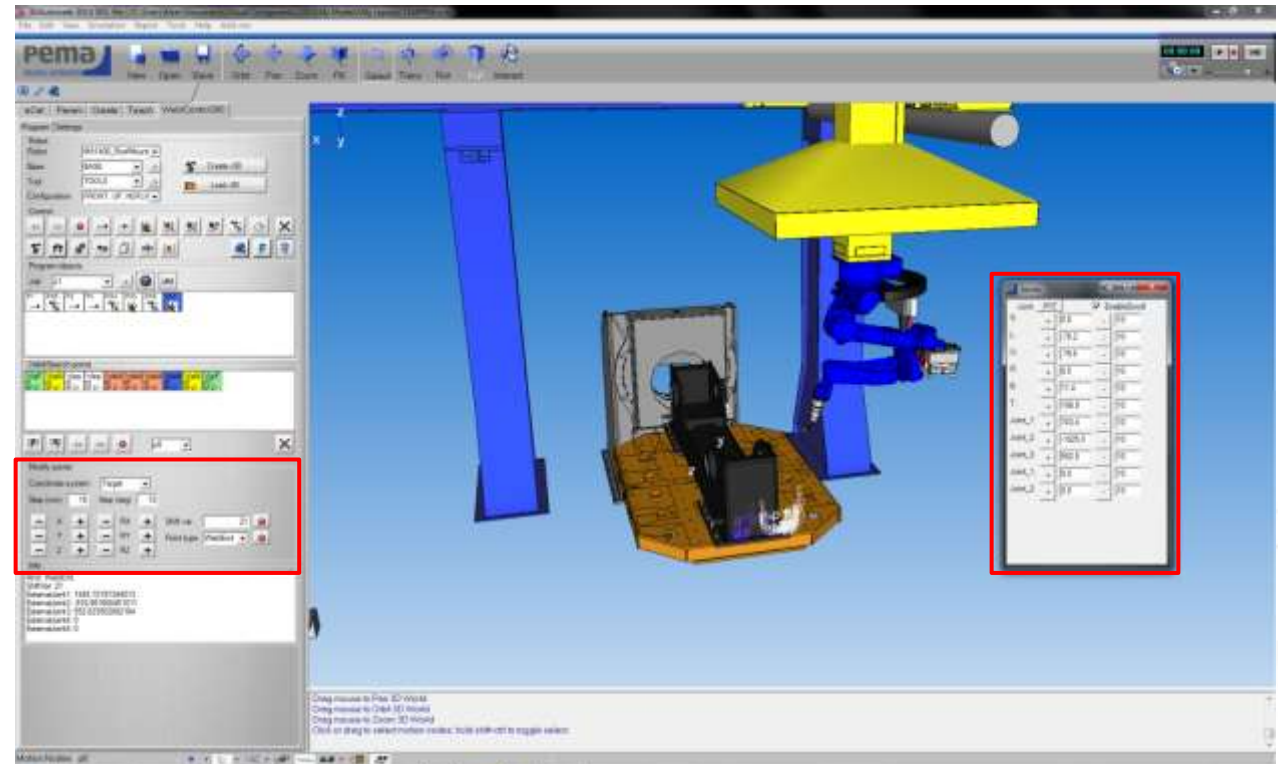
WeldControl 300 Offline – Functions

- Weld primitives
 - Straight
 - Curved
- Automatic gantry & positioner calculation



WeldControl 300 Offline – Functions

- Copy functions
- Mirror function
- Point/path modification tools
- Multipass tool
- Work piece calibration



Summary of PEMA One-Off Production Solutions

- Successful one-off production requires at least implementation of off-line programming
- For suitable product portfolios Create and Scan solutions rise up productivity and quality even more!
- Which can be made once, can be made multiple times
- Usability of the software – from welders to welders

Make More.



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