

CAM for robot welding

Offline programming software for arc-welding robots

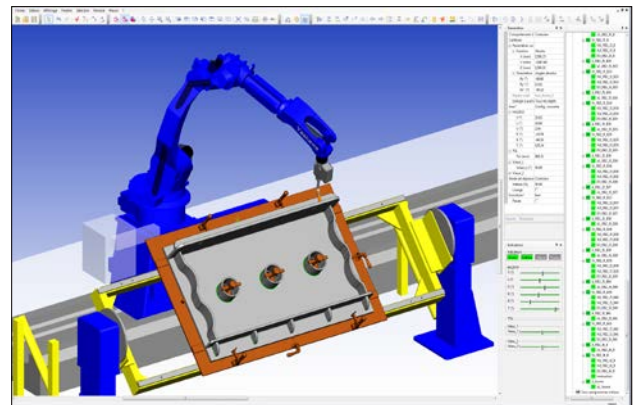


almaCAM Weld, dedicated to the offline programming of arc-welding robots, allows you to optimize the utilization rate of your robots resulting in increased flexibility and improved productivity. A precursor over the past fifteen years, **almaCAM Weld** is now the leading solution in the field of arc-welding robot offline programming and is praised by several manufacturers and integrators who propose **almaCAM Weld** to their customers.

Through a graphical interface, **almaCAM Weld** allows you to program a robot from a virtual scene and qualified welding conditions. The parts or assemblies to be welded, together with the tooling, are imported from a 3D CAD system via native or neutral formats (STEP and IGES). A specific simulator allows you to take into account all the controller parameters and to simulate the movements of the robot on the screen.

almaCAM Weld combines welder know-how together with programming and simulation tools that allow you to create programs in optimal conditions, and even to validate the design of a tooling or to study a cell set-up. In some conditions, **almaCAM Weld** can generate programs that will require no further touch-ups in the workshop.

A post-processor specifically adapted to the controller allows generating in robot language the programs prepared with **almaCAM Weld**. Thanks to specific cell and part-program sizing functions, the user can benefit from the automatic error correction functions available in the robots (shifting of trajectories via sensing of joint follow-up, laser camera, etc.). **almaCAM Weld** can also manage the multi-controller functions of the new models of robots, i.e. two robots and one manipulator that are synchronized.



Advantages and benefits

- Improved productivity thanks to the offline programming (reduction of robot idle periods and reduction of programming costs).
- Much faster than programming by teaching.
- Possibility to immediately start programming after creating the virtual models of assemblies to weld.
- Automatic search for collision-free trajectories.
- Full and realistic simulation with the complete cell which guarantees the reliability of both the cell design and cell production.
- Improved quality thanks to the integration of all the welding parameters (torch angles, stick out, etc.).
- Reduction of programming cycle for similar parts thanks to the automatic transfer of welding programs.
- Improved working conditions and increased safety.

Main functions

Working environment

- Operation with single or floating licences.
- Integrated Visual Basic® programming language for macros development.
- Hierarchical display (tree-view) of the cell objects and NC program.
- Possibility via **almaCAM Weld** control panel to visualize axis movements and check visual indicators for limit values of certain parameters (accessibility, collision, speed and job).
- Possibility to apply the characteristics of a selected object to another one or several other ones (Isology function).
- Easy and simple handling of objects in space using the graphic tool (manipulation sphere).

3D-CAD model import and modeling

- Import of parts and tooling in IGES and STEP formats.
- Import of native 3D models in option (Catia® V4/V5/V6, PTC Creo®/ProENGINEER®, Inventor®, Parasolid®, SAT/ACIS®, Solid Edge®, SOLIDWORKS®, Unigraphics®, etc.)
- Cell modeling functions in option (robots, manipulators, gantries, tooling, parts).

Calibration

- Repositioning the part according to the robot requirements.
- Robot cell calibration task to be completed by Alma during on-site software installation and launching (the virtual cell characteristics are updated according to the actual cell ones).

Welding task definition

- Torch angles, wire length and welding speed at characteristic points.
- Welding parameters (current and weaving) at characteristic points.
- Multi-pass seams.
- Discontinuous seams.
- Sequencing of weld beads.
- Duplication of a seam model.
- Visualization of the torch when defining the weld beads.

Welding program creation

- Generation of a program based on the defined welding task.
- Generation of sub-programs or sensing sequences to reposition the seams.
- Selection of axis configurations (robot and external axes) from pre-defined lists adapted to each robotics cell (for example: free gantry and fixed manipulator) to automatically find an optimal robot position.
- Duplication of welding parameters with the “isology” function.
- Copy of a welding program within a same part.
- Automatic transfer of a welding program from a template part to a similar part with different dimensions.
- Moving the program points using a “3D mover” tool.
- Detection of collisions on the complete model of the installation (part, tooling and machine).
- Automatic check of the whole program with visualization of potential anomalies from the “tree view” (speed, collisions, accessibility and craft tolerances).
- Realistic program simulation integrating the robot features (speed, acceleration and specific points) and calculation of the cycle time.
- Multi-robot programming (continuous synchronization between the movements of several robots and external axes).
- Automatic generation of collision-free trajectories to the seams.
- Management of tool grasp and ungrasp (for example: change of torch or ungrasp of a camera).

Post-processors

- Generation of the welding program in controller language, taking into account the movement instructions in the different shift modes (circular, linear, etc.), the welding parameters (speed, dwell time, current and weaving parameters), the external-axis shifts and the seam corrections with sensor.
- Management of peripheral units of laser-camera type.

Workshop document

Generation of workshop documents gathering all the information related to the welding program (bead length, cycle time, etc.)

