

RoboDK Add-In for SolidWorks

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RoboDK Add-In for SolidWorks

The RoboDK add-in for SolidWorks allows you to combine SolidWork's 3D CAD modeling features with RoboDK for robot simulation and offline programming.

With the RoboDK plug-in for SolidWorks you can easily load 3D models created in SolidWorks to RoboDK. This plug-in allows you to program more 500 different robot arms directly from SolidWorks.

Robot programs can be generated directly from a group of curves or points. You can also create an NC program such as G-code or an APT file and load it in RoboDK.

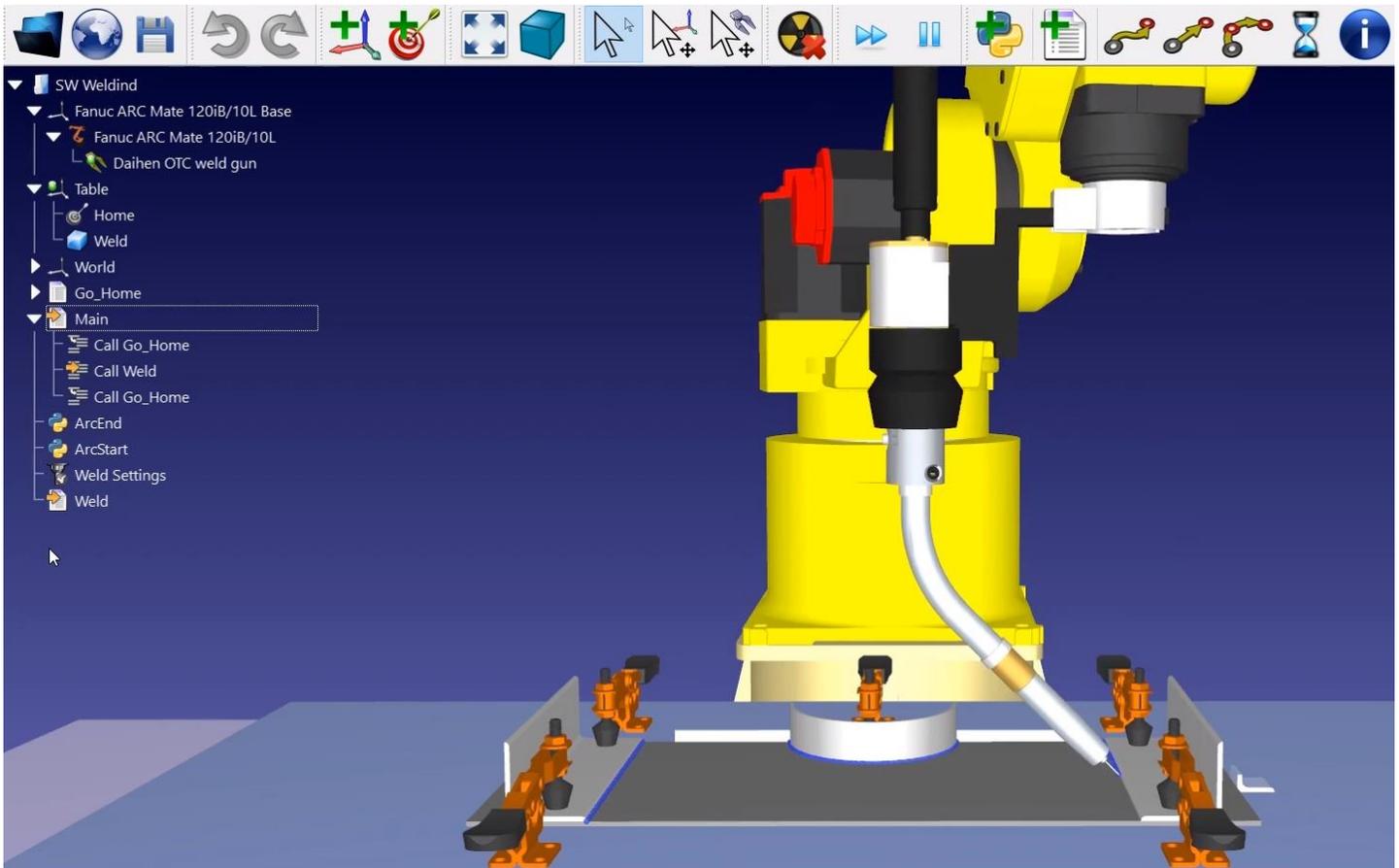
Robots can be easily programmed as 5-axis machines for a wide variety of manufacturing applications such as drilling, welding, trimming, 3D printing or robot machining. More information available in the [robot machining section](#).

The [robot post processors section](#) shows a list of the robot brands and controllers supported. It is also possible to modify or create new post processors to customize program generation.

Video: Overview of the RoboDK plug-in for SolidWorks: <https://www.youtube.com/watch?v=TjPy0VfAT98>. A more detailed video tutorial is available with the [robot welding example](#).

Note: Read this [Getting started guide](#) if this is your first time using RoboDK.

The RoboDK plug-in for SolidWorks works for SolidWorks 2016 and later. The RoboDK SolidWorks plug-in is free, however, certain options in RoboDK require [purchasing a license](#).



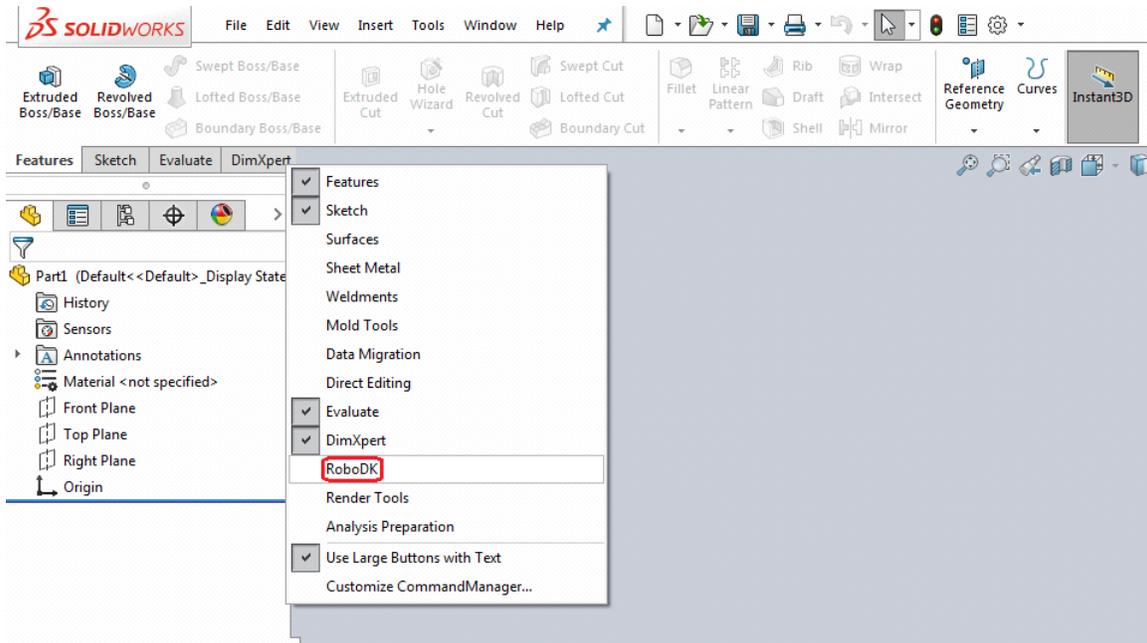
Install

If you have already installed SolidWorks and RoboDK you should have the RoboDK plug-in for SolidWorks available from Solidworks.

The RoboDK plug-in for SolidWorks contains a Toolbar. Each button of the toolbar is linked to a RoboDK command.

Tip: To display the toolbar: Right click the Command Manager and select RoboDK, as shown in the following image.

Note: If you don't see the RoboDK toolbar (or the plug-in) in SolidWorks you should follow the instructions to [install the plug-in manually](#).



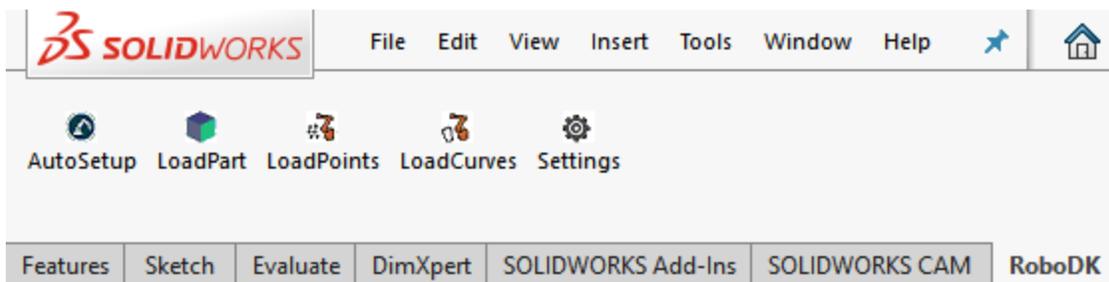
Note: If you start RoboDK from the SolidWorks plug-in it will change RoboDK's default settings to match SolidWork's 3D mouse navigation and window style. This behavior can be modified from the [Plugin settings window](#). Or by setting the [default RoboDK settings](#).

Note: If the RoboDK toolbar is not displayed in SolidWorks you should enable it by selecting **Tools**→**Add-Ins**, check the **RoboDK Plug-In**.

If the RoboDK plug-in is not available, you can follow the [manual installation steps to install the RoboDK plug-in for SolidWorks](#).

SolidWorks Toolbar

The default RoboDK toolbar includes 5 buttons:



-  **Auto Setup** – This button allows you to select any geometry (curves or points) and they will be loaded in RoboDK together with the 3D model.
-  **Load Part** – Loads the 3D model from SolidWorks to RoboDK. Features such as curves or points won't be loaded.

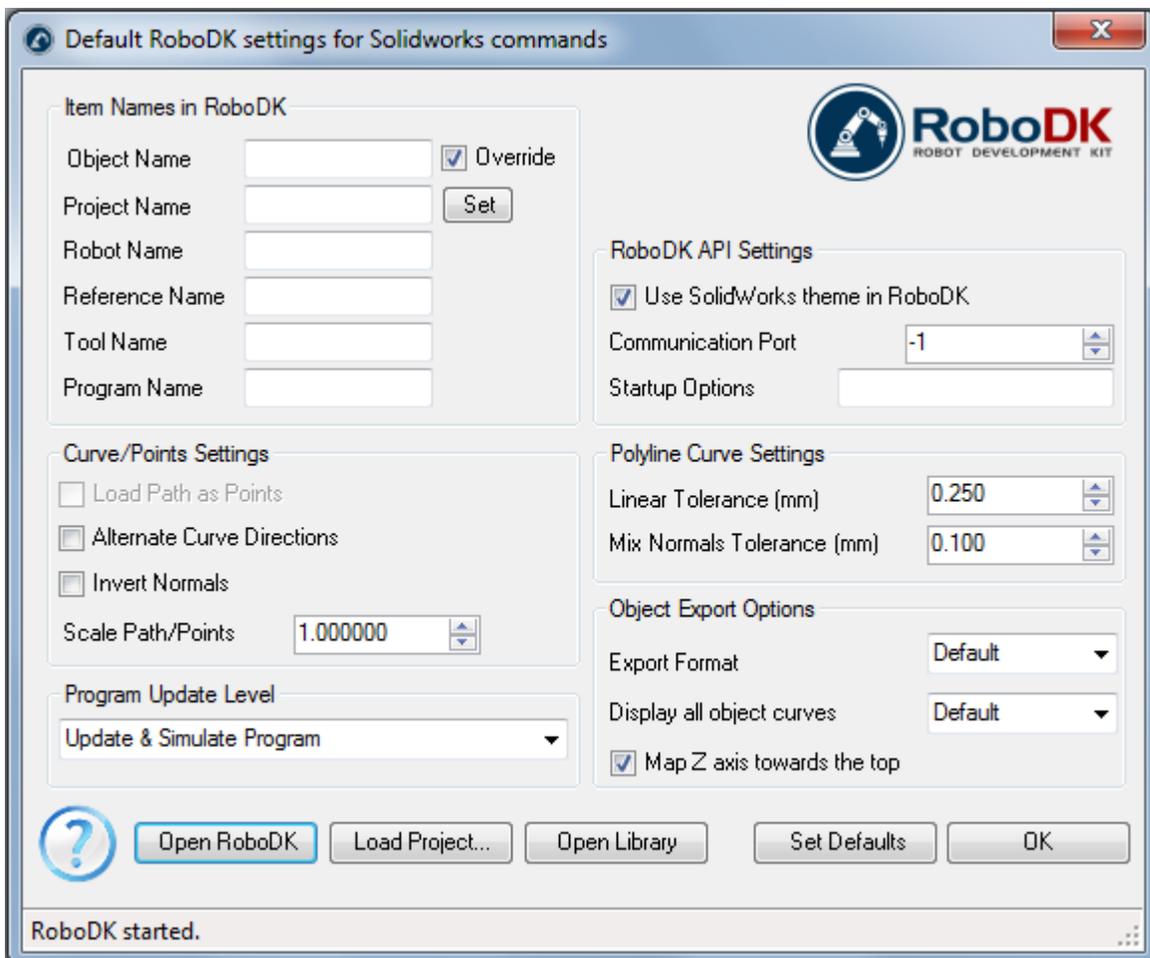
-  **Load Point(s)** – Load all the points selected in RoboDK as a new object. All selected surfaces will be used to calculate point normals. These normals are important as they define the robot's approach axis.
-  **Load Curve(s)** – Load all the curves selected in RoboDK as a new item. All selected surfaces will be used to calculate curve normals. These normals are important as they will define the robot's approach axis.
-  **Settings** – Open the [default Settings window](#).

The main difference between **Auto Setup** and **Load Curve(s)** or **Load Point(s)** is that Auto Setup loads the part and creates a new Curve/Point follow project. Using Load Curve(s) or Load Point(s) is faster and will just update the existing geometry features in RoboDK, keeping previously defined settings.

Note: If you want to load more than one object from SolidWorks you should rename the objects once they have been loaded in RoboDK.

Settings

You can change the default settings that apply to the RoboDK plug-in by selecting the **Settings** button.



- **Object Name** – Set the name of the curve/points object that will be loaded in RoboDK. If this case is left blank, the name of the part or the assembly file will be used.
- **Override** – Override the object loaded previously in RoboDK if there is a name match.
- **Project Name** – Set the name/path of the RoboDK project/station (.RDK file) to use. If the file is already loaded it will use the existing project. If the open project in RoboDK does not match with the file name it will open the project if the full path is specified.

- **Robot Name** – Set the name of the robot that will be used in RoboDK (if you have more than 1 robot in your project). The robot name must match the name visible in the RoboDK station tree. Leave this value empty (default) to use the first or only robot available.
- **Reference Name** – Set the name of the reference frame to place the path with respect to the robot. The name should match the visible name in the RoboDK station tree. If a name is not provided, the active [Reference Frame](#)  will be used.

Tip: If you want to use a numbered Reference frame automatically you can add the reference number at the end of the name. For example: 'Reference 1'.

- **Tool Name** – Set the name of the tool (TCP) to use with the robot to follow the path. The name should match the visible name in the RoboDK station tree. If a name is not provided, the active [Tool Frame](#)  will be used.

Tip: If you want to use a numbered Tool automatically you can add the tool number at the end of the name. For example: 'Tool 1'.

- **Program Name** – Set the name of the program file that will be generated.

Note: Make sure you select the option to generate the program and code to see the program.

- **Load Path as Points** – Check this option to convert a curve into points, so a [Point follow project](#) will be created in RoboDK. This is useful for manufacturing operations such as drilling. Uncheck this option to load the path as a [Curve follow project](#).
- **Alternate Curve Directions** - Check this option to alternate the direction of movement with each pass (Zig-Zag pattern).
- **Invert Normals** – Check this option to invert the calculated surface normals. This will flip the robot's tool orientation.
- **Use SolidWorks Theme in RoboDK** – Start RoboDK with a SolidWorks theme. This includes changing the behavior of the mouse for 3D navigation and the background color. These settings can be changed in the RoboDK menu Tools-Options.
- **Communication Port** – Set the communication port to communicate with RoboDK. Multiple instances of RoboDK can be running at the same time and use different setups if a different port is used. When this value is set to -1 (default), the default port is used (20500).
- **Startup Options** – Set the arguments to pass to RoboDK the first time it starts. For example, to start RoboDK quietly you can set '/NOSPLASH /NOSHOW /HIDDEN'. Programs can still be generated even if RoboDK is not displayed. More information in the [Command Line](#) section of the RoboDK API.
- **Linear Tolerance (mm)** – Set the linear accuracy to split curves as a set of points.
- **Mix Normals Tolerance (mm)** – Set the distance tolerance used to mix normal calculations among multiple surfaces.
- **Export Format** – Select the export format to load the part in RoboDK.
- **Display all object curves** – Display the curves loaded in RoboDK even if they are not selected. You can change this setting in RoboDK (Tools-Options-Display-Display Curves).
- **Map Z axis towards the top** – Apply a rotation to the part or the assembly to match the Z axis in RoboDK. This makes sure that the isometric view in RoboDK is the same as in SolidWorks.

Buttons:

- **Open RoboDK** – Open a project in RoboDK... A new window will open with additional options.
- **Load Project ...** – Load the RoboDK project (RDK file) that you want to use for your current project.
- **Open Library** – Open RoboDK's [online library](#).
- **Set Defaults** – Set the default settings for the component.
- **OK** – Apply these settings and close this window. Not selecting OK will not apply any settings you changed.

Examples

This section shows basic examples to load a SolidWorks project in RoboDK for robot simulation and offline programming purposes.

Robot Welding

The following example shows how you can create a simple toolpath for robot welding from SolidWorks.

Video: Robot programming with SolidWorks for a robot welding application:
<https://www.youtube.com/watch?v=mF6Fn6HxHJ8>.

Liquid dispensing

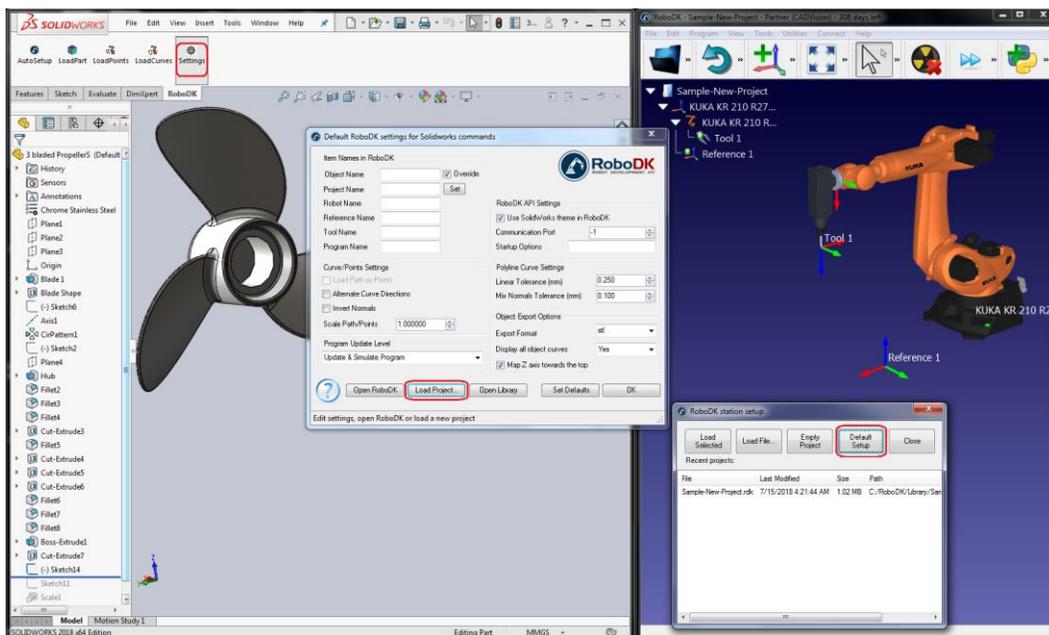
The following example shows how you can program a robot for a liquid dispensing application using SolidWorks and RoboDK.

Video: Robot programming with SolidWorks for a liquid dispensing application:
<https://www.youtube.com/watch?v=ikiwigxWPow>.

Propeller Example

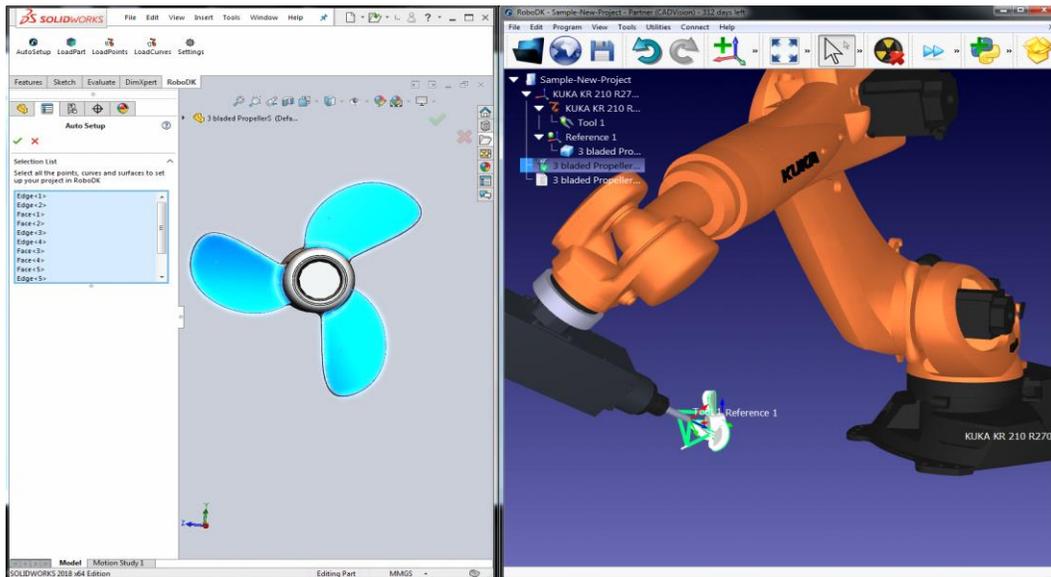
This example shows how to load a sample RoboDK station (default setup) and follow a set of curves defined in SolidWorks with the robot.

1. Load the 3 bladed Propellers example in SolidWorks.
2. Select the RoboDK tab and select  **Settings**.
3. Select **Load Project...**
4. Select **Default Setup**. RoboDK will start and load a sample project with a KUKA robot, one tool (a spindle as Tool 1) and one reference frame (Reference 1).



5. Close the Settings window or select OK.
6. Select the  **Auto Setup** button in SolidWorks.
7. Select all the curves and surfaces and press OK in Property Manager Page. The project will be loaded in RoboDK as shown in the following image.

You should see the part loaded on the active reference frame (Reference 1) and a new Curve follow project in RoboDK that follows the toolpath.



Tip: Press the + or – key to make the reference frames bigger or smaller.

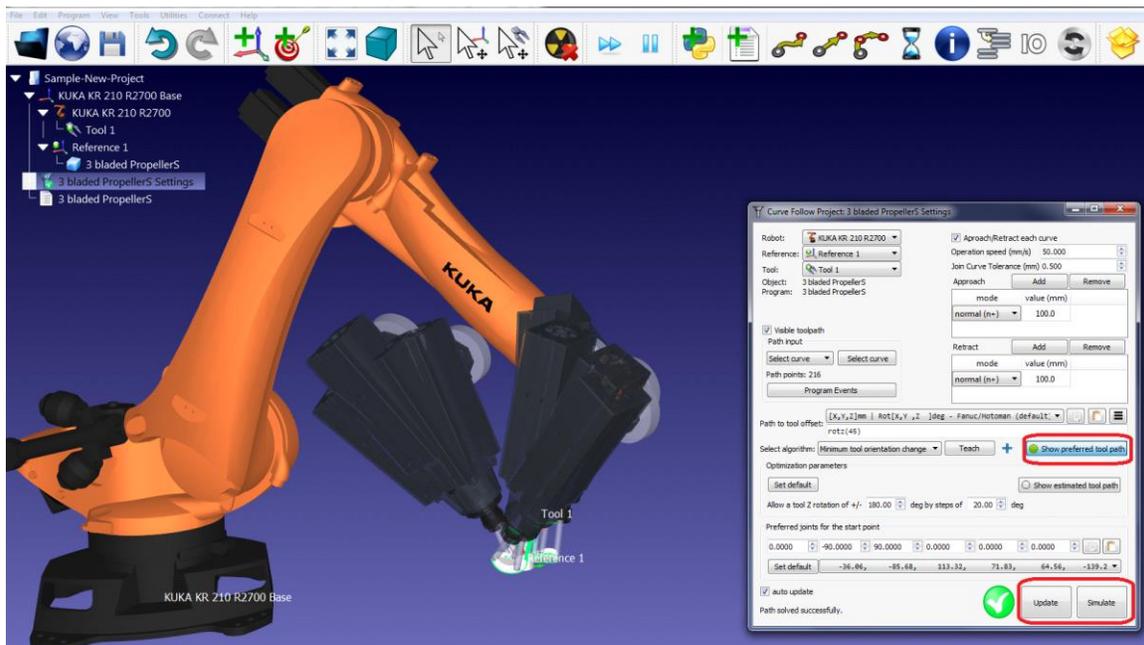
You can see the approach movement is normal to the toolpath. The robot should be able to move along the toolpath without any issues.

Tip: Hold the **Alt** key to move a reference frame or the robot in the 3D view.

Double click the  **3 bladed Propeller Settings** from the RoboDK tree to open more options and customize the toolpath followed by the robot.

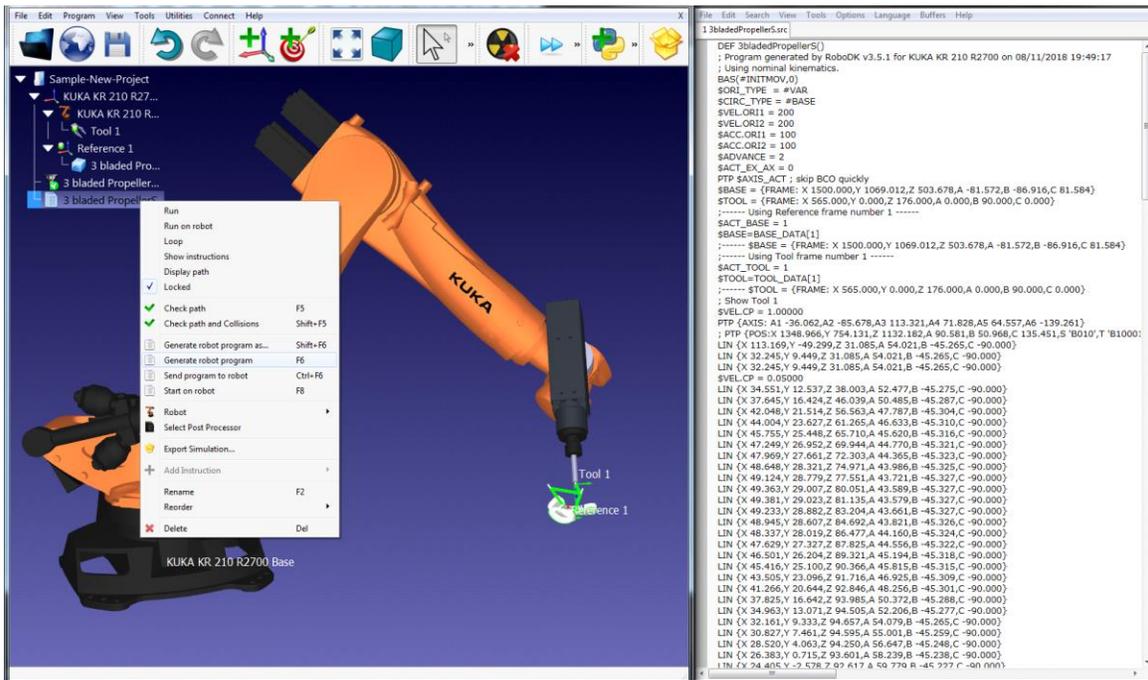
For example, you can select **Show preferred tool path** to see and modify the default orientation of the tool with respect to the part. Change the **Path to tool offset** value to define an additional rotation. To do so, you can enter a new value or just use the mouse wheel to see a quick preview of the result.

More information to change these settings is available in the [robot machining section](#).



Finally, when the simulation produces the desired result, you can generate the program or export the simulation:

8. Right click the program
9. Select **Generate robot program** (F6). The robot program will be generated and displayed.



Tip: Right click a program and select **Show Instructions** to see the instructions generated and debug the program. New instructions can be manually added by selecting **Add Instruction**.

Tip: More information about selecting the right post processor is available in the [Post Processor](#) section.

Tip: Select [Export Simulation](#) to generate a 3D HTML or a 3D PDF simulation.

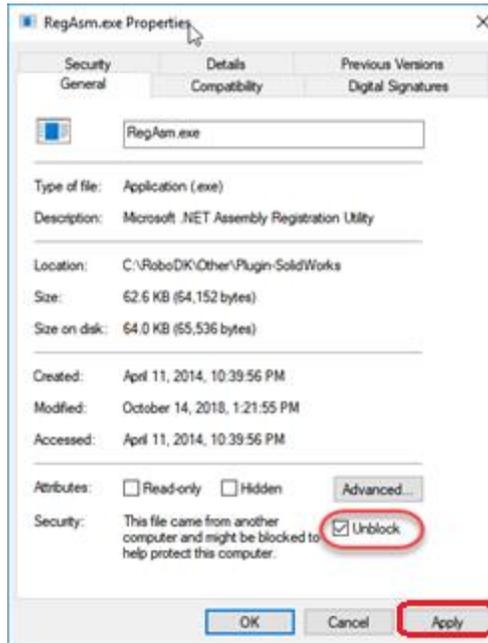
Manual Install

These are manual steps to setup the RoboDK plug-in for SolidWorks. You should follow these steps if the RoboDK plug-in for SolidWorks was not automatically installed by default using the RoboDK installer:

1. Install [SolidWorks](#).
2. Download and install [RoboDK](#).
3. Download the [RoboDK plugin for SolidWorks](#).
4. Unzip the RoboDK plug-in for SolidWorks folder in **C:\RoboDK\Other\Plugin-SolidWorks**

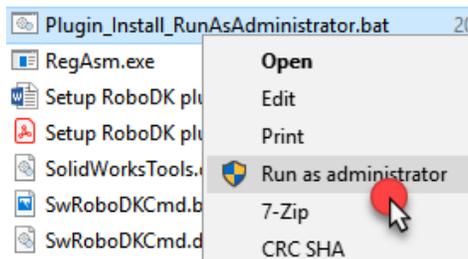
Unblock the EXE and DLL binaries:

5. Right click the file **RegAsm.exe** and select **Properties**.
6. Select **Unblock** and **Apply**.
7. Repeat steps 5 and 6 for the other two DLL files.



Load the RoboDK plug-in in SolidWorks:

8. Run the **Plugin_Install_RunAsAdministrator.bat** file as **Administrator**: Right click the BAT file and select Run as Administrator.



9. Start SolidWorks and go to **Tools→Add-Ins** (in SolidWorks). You'll find the **RoboDK Plug-In Addin**.

Note: Run the BAT file as Administrator.

Note: Don't change the location of the binaries after running the BAT file.

