6.3 Collision Avoidance

Overview

The *Collision Avoidance* function monitors the *geometries* of the robot and its *work envelope* and stops the robot from a possible collision. The static geometry surrounding the robot can also be included in the configuration. This is useful where object positions are dynamically created during runtime by cameras or sensors. The predicted collision can be visualized in the RobotStudio Online Monitor. Collision Avoidance is active during jogging and program execution.

The Collision Prediction supports convex geometries such as points, line segments, and convex polygons. Non-convex objects must be split into smaller parts that can be approximated. The Convex Hull has two parameters for controlling the complexity of the collision model, **Max outside tolerance** and **Max inside tolerance**. The **Max outside tolerance** allows inclusion of a bigger approximated object than the original geometry. The **Max inside tolerance** allows the approximated object to be smaller than the original geometry.

In RobotWare 6, the option **Collision Detection** must be selected to enable this functionality.

This feature is available for all six and seven axis backwards bending robots, supported by the standard IRC5 controller.

Note

A premium license of RobotStudio is required to load a geometrical object of type **.SAT*. The corresponding CAD converter option is required for other formats. Only polygon models can be loaded in the Basic version.

Activating Collision Avoidance

This feature can be activated from the **Controller** tab.

- In the **Controller** tab, in the **Configuration** group, click **Collision Avoidance** and select **Activate Collision Avoidance**.
- Alternatively, in the **Controller** browser, right-click any controller and from the context menu, click **Collision Avoidance** and select **Activate Collision Avoidance**.

Configuring collision avoidance

1. In the **Configuration** group, select **Collision Avoidance** > **Configure**.

   The **Collision Avoidance** window appears.
2. Under **Objects** group, click **Add**, and select **Station object**, **Primitive**, or **Load geometry...** from the drop-down list.

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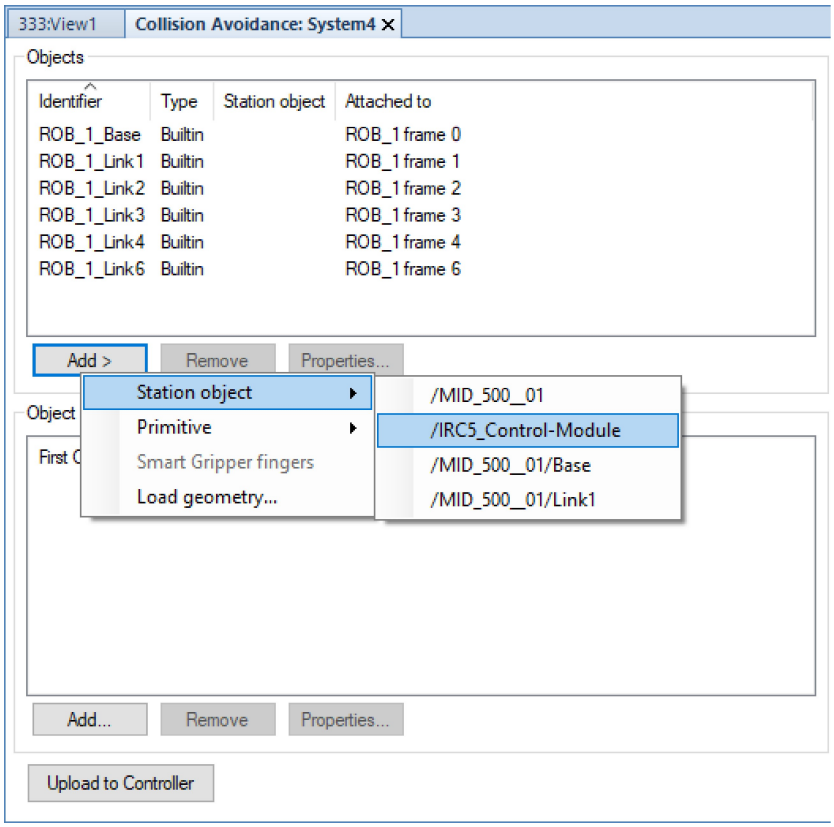
This option allows you to create collision models for predicting collision.



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Select the option	To
Station object	Add an existing object or modify its properties
Primitive	Add an object and modify its properties
Smart Gripper fingers	Add smart gripper fingers (only applicable for YuMi)
Load geometry	Add a CAD geometry and modify its properties

3 The **Collision Object Properties** dialog box opens, set and modify the **Properties**, **Convex Hull**, and **Position** of the object.

4 Click **OK**, to add the object to the **Objects** list.

Note

A maximum of 10 objects can be added.

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6.3 Collision Avoidance
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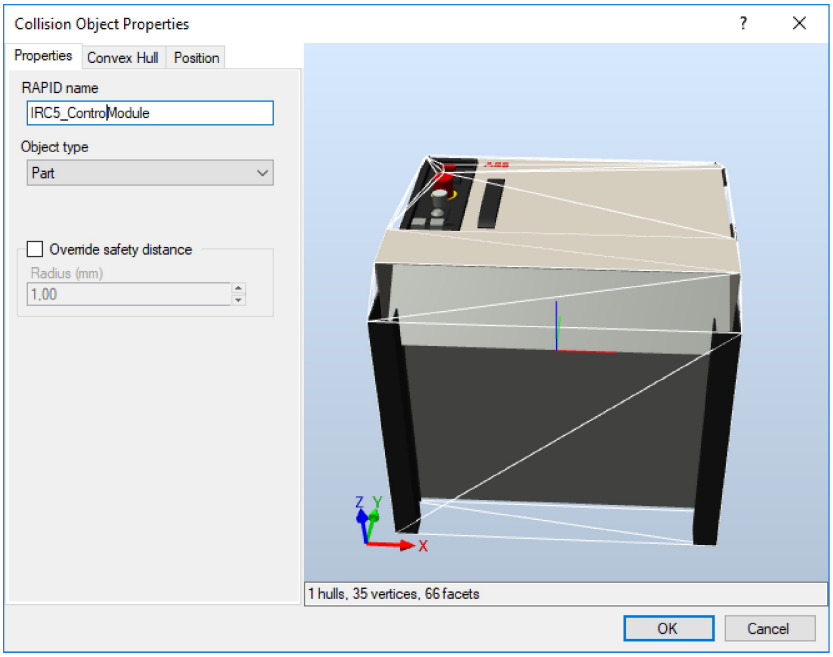

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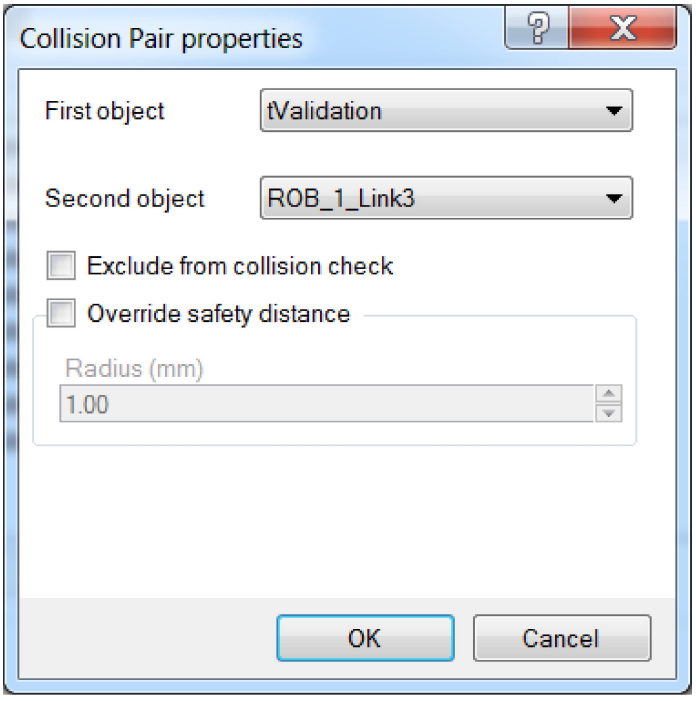
To easily configure multiple objects, they can be paired.

5 Under **Object Pairs** group, click **Add**, the **Collision Pair properties** dialog box opens.



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6 Select the objects to be paired for collision avoidance from their respective drop-down lists.

7 Select the **Exclude from collision check** checkbox, to exclude the paired object from the collision check.

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8 Select the **Override safety distance** checkbox, to override the preset safety distance.

9 Click **Ok**, to pair the objects and add it to the **Object Pairs** list.

10 Click **Upload to Controller**, to upload the configuration to the real controller.

Using the **File Transfer** feature a collision avoidance file can be transferred from the **HOME** folder of the *virtual controller* to the real controller.

Limitations

Collision Avoidance is a function included in the option *Collision Detection*.

Collision Avoidance can only be used by six and seven axis serial link robots (bending backwards). It is supported by robots with track motion and single axis *positioner* (L-type).

When jogging, *Collision Avoidance* will not be triggered if used together with responsive jogging. The system parameter *Jog Mode* must be changed to *Standard*.

The Collision Avoidance between 2 robots (or more) can only be achieved when using a MultiMove system.

CAUTION

Collision Avoidance shall not be used for safety of personnel.