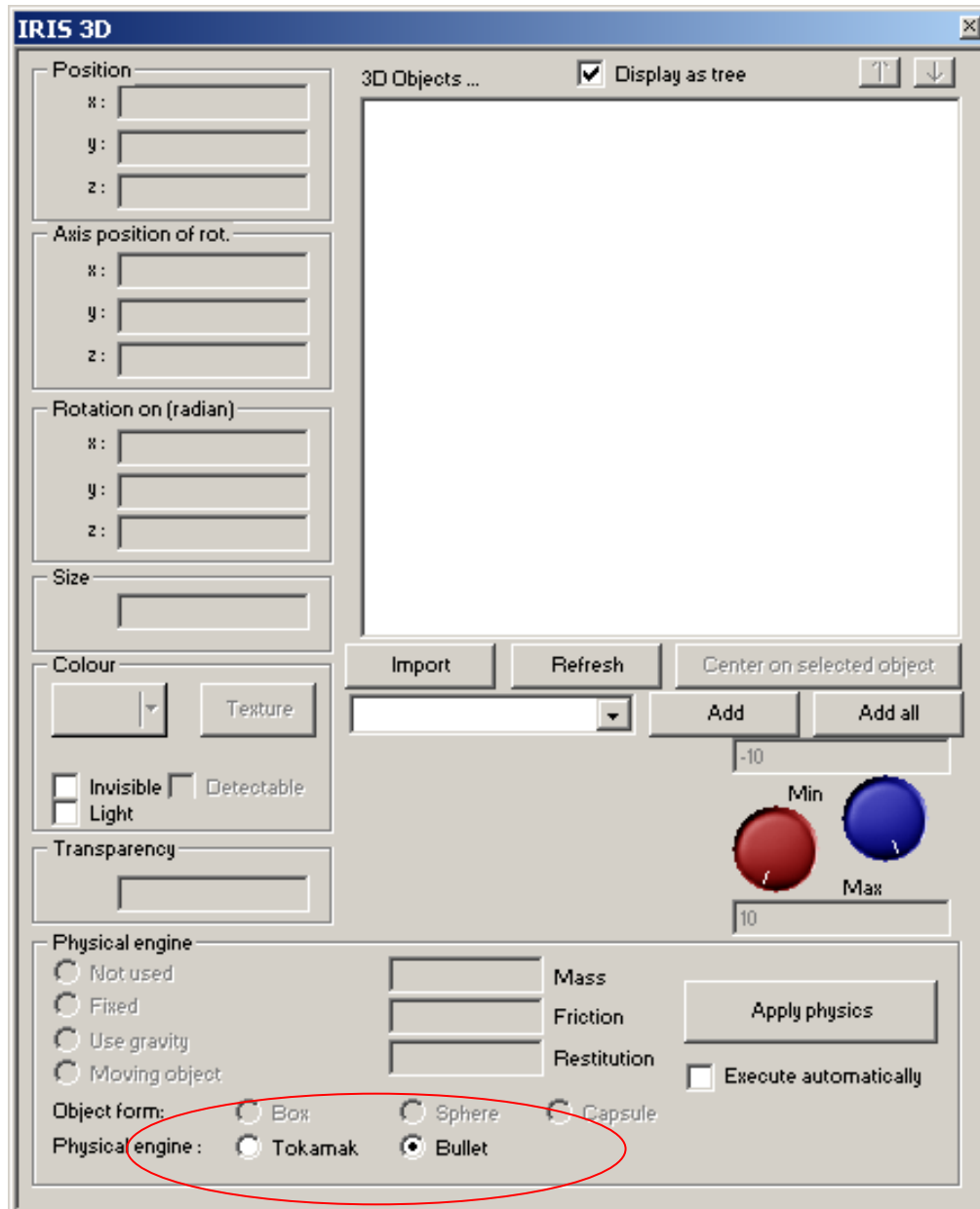


# Robots simulation with AUTOMGEN<sup>8</sup>

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## Main concepts

AUTOMGEN 8.012 release allows robots simulation. This release uses a new physical engine (Bullet) to carry on this simulation. Tokamak physical engine is still usable to ensure compatibility with old applications. The choice of the physical engine is made on the IRIS3D configuration dialog box:

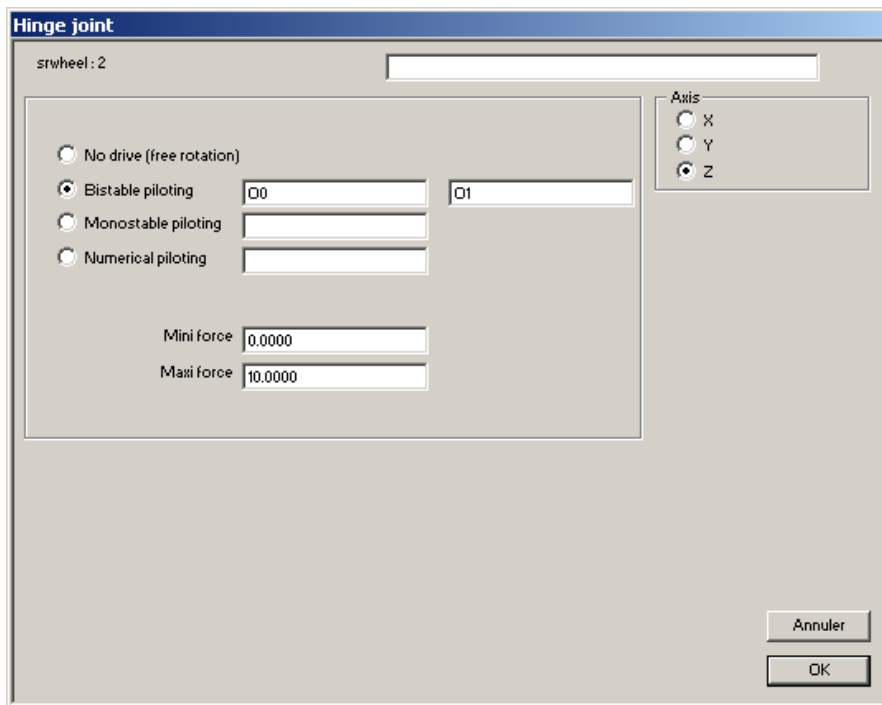


Robots simulation uses « standard » objects in IRIS3D for robot body and wheels.

Body and wheels must be defined as « Use gravity » objects.

A link and «rotation» behaviour must be created between each wheels and the robot body.

In this case, the «rotation» behaviour is different :



«Hinge joint» appear in the title bar.

«Axis» defines joint axis.

«Mini Force» and «Maxi Force» define force which is going to be applied on the wheel.

Force is applied depending on the piloting used:

«No drive»: free rotation of the wheel.

«Bistable piloting»: in this case, two boolean variables will fix the force applied on the wheel like this:

Variable 1	Variable 2	Result
0	0	Free rotation
1	0	Maxi Force maxi applied
0	1	- Maxi Force maxi applied
1	1	Brake

«Monostable piloting» : in this case, if the boolean variable is true then the Maxi Force is applied, if the boolean variable is false, Mini Force is applied, if Mini Force is equal to 0, the rotation is free.

«Numerical piloting»: in this case a 16 bits word fixes the force to apply.

Word value can be from -100 to 100. -100 will generate a 100% -Maxi Force force and 100 will generate a 100% Maxi Force force. 0 value will generate a brake state. Other values (<-100 or >100) will produce a free rotation state.

## Examples

You can find robot simulation samples in the «Examples\Process Simulation\3D\Physical engine\Robots» sub directory of the AUTOMGEN installation.

### Simple robot

A simple sample showing a moving robot. Moves are processed with timers.

### Line

A sample showing a robot following a line. This sample uses collision tests for simulating an optic sensor.

### Proximity sensor

A sample showing a proximity sensor allowing the robot to avoid walls. A collision test is also used in this sample with an invisible object for the sensor.

### Proximity sensor (2 robots)

Same sample with 2 robots (more than one robot can be used in the same simulation). Proximity sensors detect walls and the other robot.

### Cleaner

A sample simulating robot vacuum. Dust particles are processed with standard 3D objects, a collision test and a “if collision” conditional link are used for simulating dust particles aspiration. Automation program used a random timer when robot detect a wall to make a rotation and so browse whole surface.