

Fixed Joint

base model: `models/RigidBody.mdl`

final model: `models/FixedJoint.mdl`

Interactors

- ▶ All kinds of Joints, Forces and Torques are so-called interactors
- ▶ They always connect two Frames
- ▶ Whereas Frames have to be placed inside a body
- ▶ Thus, an interactor always connects two bodies
- ▶ The Frames are used to model the appropriate contact points or interaction points
- ▶ The template **FixedJoint** can be used to model
 - ▶ A rigid connection between two bodies
 - ▶ A rigid support of a body

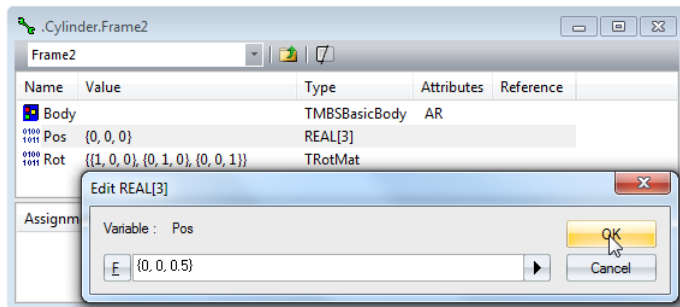
Preparations for the FixedJoint

Open the base model `RigidBody.mdl` in `alaska/ModellerStudio`

- ▶ We want to equip the `Cylinder` with a rigid support
- ▶ Therefore we fix it rigidly to the `Ground`
- ① Insert a **TFrame** to the `Ground` and name it "Frame1"
(Have a look at the tutorial `Add a New Model Element` for inserting Frames)
- ▶ The fixing should be modeled at the upper end of the `Cylinder`
- ▶ So we start by modeling a Frame at the desired position
- ② Add a **TFrame** to the `Cylinder` with the name "Frame2"
- ▶ The reference Frame or coordinate system of the `Cylinder`, the BFR, sits in the middle of its rotational axis
- ▶ The rotational axis is always the 3-axis or z-axis of the `Cylinder`
- ▶ To translate `Frame2` to the upper end of the `Cylinder`, we have to move it by half the length, which is 0.5 m

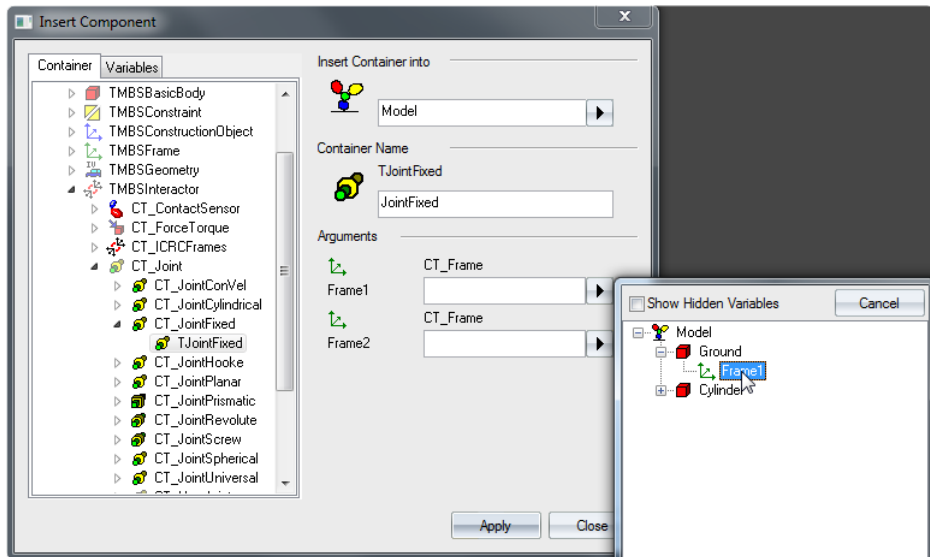
Preparations for the FixedJoint

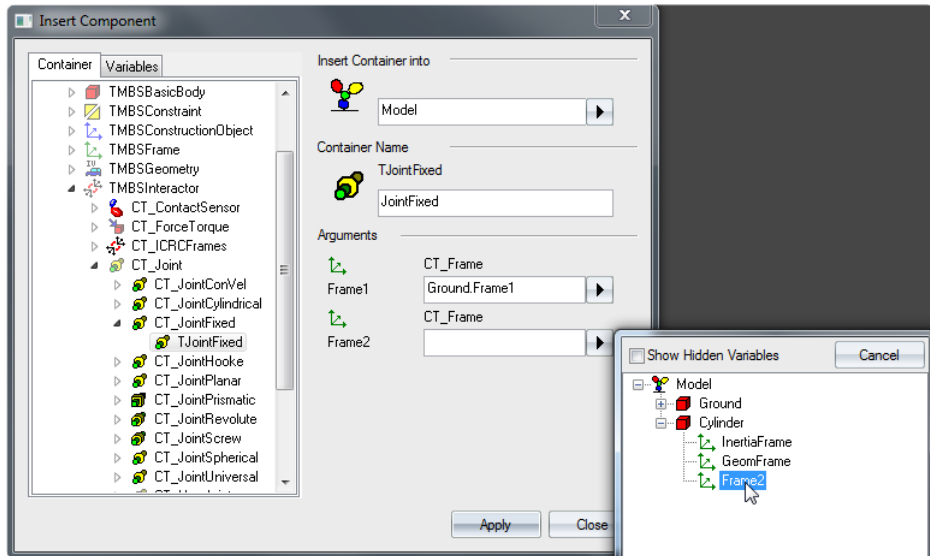
- 3 Open the list of model elements inside the `Cylinder` by clicking the triangle in front of it
- 4 Double-click on `Frame2` to open its "Component View"
- 5 Double-click on the variable `Pos` to change the relative positioning of the Frame
- 6 Change the entries of the vector in the opened editor to $\{0, 0, 0.5\}$ and click on `OK`



Inserting the FixedJoint

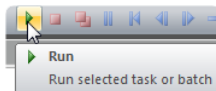
- 1 Use the `Viewer` to control the positioning of `Frame2`
- 2 left-click the "`Model`", press `F6` and select a **TJointFixed** at location
`TMBSInteractor` → `CT_Joint` → `CT_JointFixed` → `TJointFixed`
- 3 As template argument "`Frame1`" select `Model.Ground.Frame1`
- 4 As template argument "`Frame2`" select `Model.Cylinder.Frame2` as shown in the following screenshots and click `Apply`



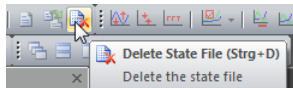


Check

- 1 To check the model go to the "Task tree" and unfold the task-batch `Batch`
- 2 Start the `Assembly` task by left-clicking it and clicking the symbol run



- 3 You may get an error, as the state variables changed after inserting the joint; if necessary delete the state file



- 4 After a successful `Assembly` the `Cylinder` should be mounted at its top at the `Ground`
- 5 If you click on elements in the "Model Tree" their graphical visualization will be highlighted (with a yellow mesh) in the `Viewer`
- 6 While running the `Integration` task the `Cylinder` should stay at its position

Next tutorial

Next tutorial: [Insert a Revolute Joint](#)