

General Rigid Body

base model: models/NewModel.mdl

final model: models/GeneralRigidBody.mdl

A general rigid body

- ▶ It is shown how to insert a general rigid body to the model
- ▶ The body has no geometric properties and no graphical visualization
- ▶ The mass properties are arbitrary and have to be set manually

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

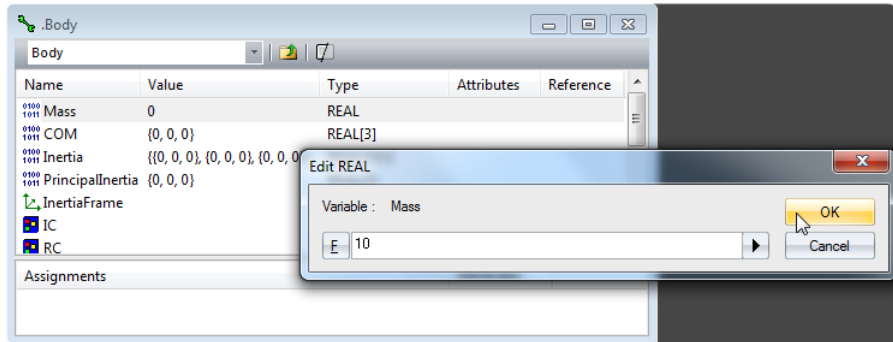
The general rigid body `TBody`

- ① Select `"Model"` at the `"Model Tree"`
- ② Press `F6`
- ③ Select `TMBSBasicBody` \rightarrow `CT_BasicBody` \rightarrow `CT_Body` \rightarrow `TBody`
 - ① Insert Container into: `"Model"`
 - ② Container Name: `"Body"`
- ④ Click `Apply`
- ⑤ (Alternatively use the `"Short Cut Tree"` and the element `Bodies` \rightarrow `Body`)

Setting mass properties: Mass

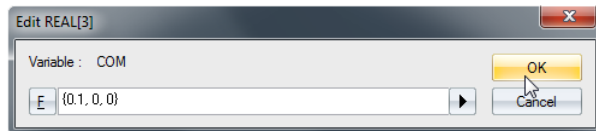
Now we can assign some arguments to the body.

- ⑥ Double-click on `Body` at the “Model Tree”
- ⑦ A window with the so-called “Component View” will open
- ⑧ Double-click on the variable `Mass` inside the “Component View”
- ⑨ An editor for REAL Variables will open
- ⑩ Enter the number 10 – which will set the mass of 10 kg – and click **OK**



Setting mass properties: Center of mass

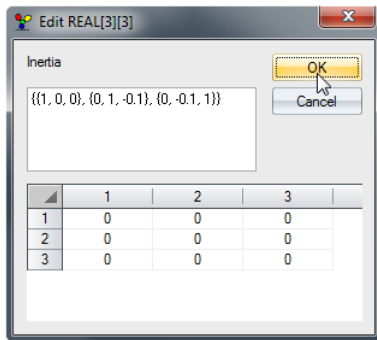
- ① Double-click on the variable *COM* to edit the center of mass (or center of gravity)
- ▶ The center of mass is a vector of REAL numbers with length three
- ▶ In alaska a vector starts and ends with curly brackets
- ▶ The components are separated using a comma
- ① Change the center of mass to lie at $\{0.1, 0, 0\}$ and press **OK**



- ▶ The center of mass is moved 0.1 m in positive z-direction
- ▶ Note: The decimal separator is a point in alaska

Setting mass properties: Moments of inertia

- ▶ The inertia tensor in alaska is represented as a 3×3 matrix
- ▶ Analogue to programming languages matrices in alaska are vectors containing vectors as elements
- 12 Double-click on *Inertia*
- 13 Change the entry in the upper box of the editor to $\{\{1, 0, 0\}, \{0, 1, -0.1\}, \{0, -0.1, 1\}\}$ and click



Next tutorial

Next tutorial: **Insert a Fixed Joint**