Intact stability calculation

The mass and centre of gravity of the whole system are input for the intact stability calculation. For this tutorial a very simplified stability calculation is used. The only input value that is required is the moment of area inertia of the waterline area.

- Create a new class in the Knowledge Browser alongside the others that you have made so far: `Intact stability calculation`.
- Create the following parameters in the **Knowledge Browser**:

Parameter name	*Dimension*	*Determined by*	*Reference*	*In Class*
`BM`	[m]	*USR: User or system/equation*	Distance between center of buoyancy and metacenter	`Intact stability calculation`
`GM`	[m]	*USR: User or system/equation*	Metacentric height	`Intact stability calculation`
`KB`	[m]	*USR: User or system/equation*	Distance between keel and center of buoyancy	`Intact stability calculation`
`KG`	[m]	*USR: User or system/equation*	Distance between keel and center of gravity	`Intact stability calculation`
`Moment_of_Inertia`	[m^4]	*USR: User or system/equation*	Moment of inertia of the water plane area, For this tutorial give a rough estimate	`Intact stability calculation`

- Include the following parameters in entity `Intact stability calculation`: `Loa`,`Boa`,`BM`, `COGX`, `COGY`, `COGZ`, `Displacement`, `GM`, `KB`, `KG` , `Moment_of_Inertia`, `Rho`, and `T_design`.
- Create the following relations (either entity relations or normal relations, it does not matter here):

`Loa = ENTITY#(xx).Loa` where "**xx**" is the `QEntityID` value of entity `Main Dimensions`.

`Boa = ENTITY#(xx).Boa` where "**xx**" is the `QEntityID` value of entity `Main Dimensions`.

```
GM = KB + BM – KG
```

```
BM = Moment_of_Inertia / (Displacement/Rho)
```

```
KG = COGZ
```

```
KB = 0.7*T_design
```

`T_design = ENTITY#(xx).T_design` where "**xx**" is the `QEntityID` value of entity `Hydrostatics`.

`Displacement = ENTITY#(xx).Mass` where "**xx**" is the `QEntityID` value of entity `Mass calculation`.

`COGX = ENTITY#(xx).COGX` where "**xx**" is the `QEntityID` value of entity `Mass calculation`.

`COGY = ENTITY#(xx).COGY` where "**xx**" is the `QEntityID` value of entity `Mass calculation`.

`COGZ = ENTITY#(xx).COGZ` where "**xx**" is the `QEntityID` value of entity `Mass calculation`.

`Rho = ENTITY#(xx).Rho` where "**xx**" is the `QEntityID` value of entity `Hydrostatics`.

- To show computed values set attribute `@SHOW` on `QEntityData`.

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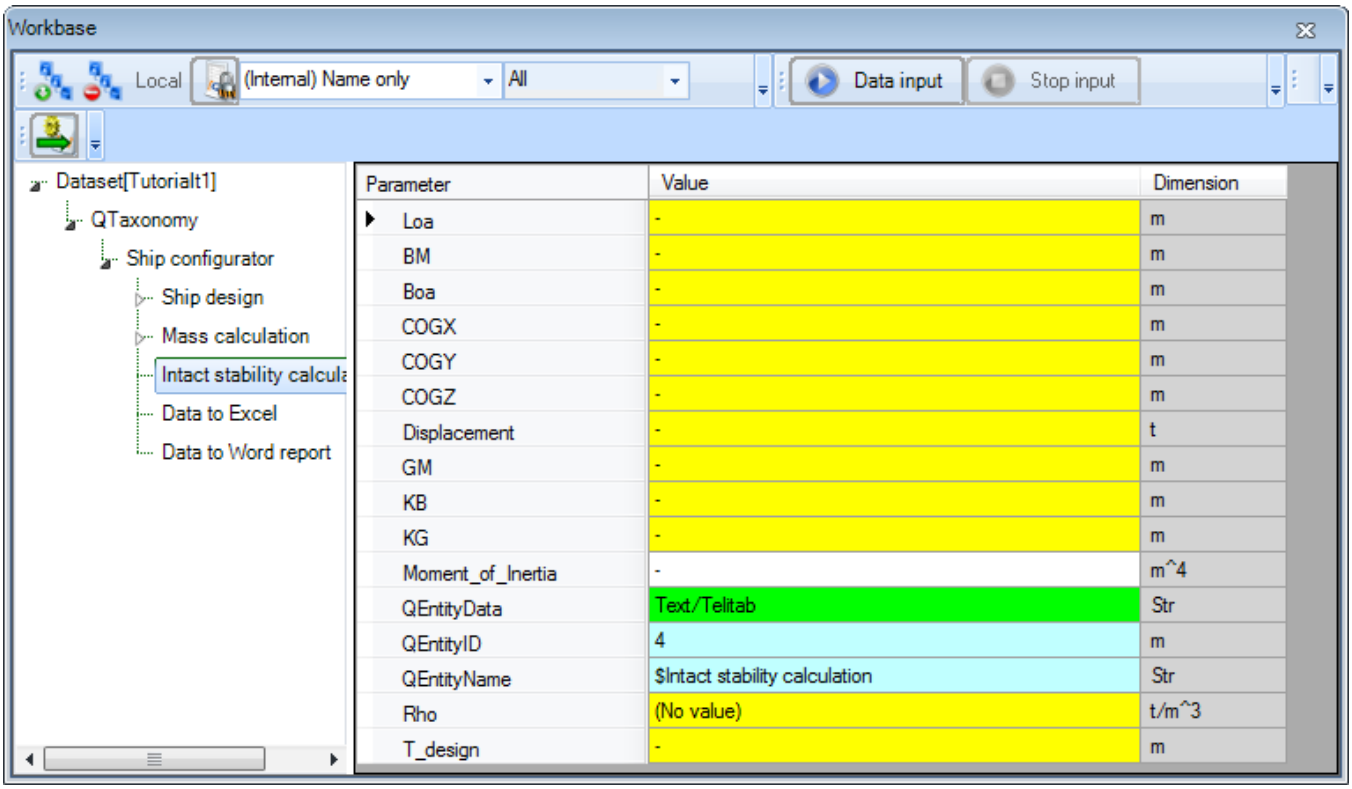

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