

Full tutorial (V2: use Solidworks constraints import)for creating a 3d machine simulation with Virtual Universe Pro: Unstacker

Courtesy of School VAUVENARGUES (Aix en Provence, France)

Thanks

IRAI thanks Vauvenargues School for the use of Solidworks files used for this tutorial.


Prerequisites


Virtual Universe Pro 2.101 is required for this tutorial. Next versions are also compatible.


The last Virtual Universe Pro release can be downloaded at www.ira.com/vup


Symboles


Les symboles suivants sont utilisés dans les copies d'écran :


Clic gauche de la souris : 

Double clic gauche de la souris : ²

Clic droit de la souris : 

Glisser déplacer : 

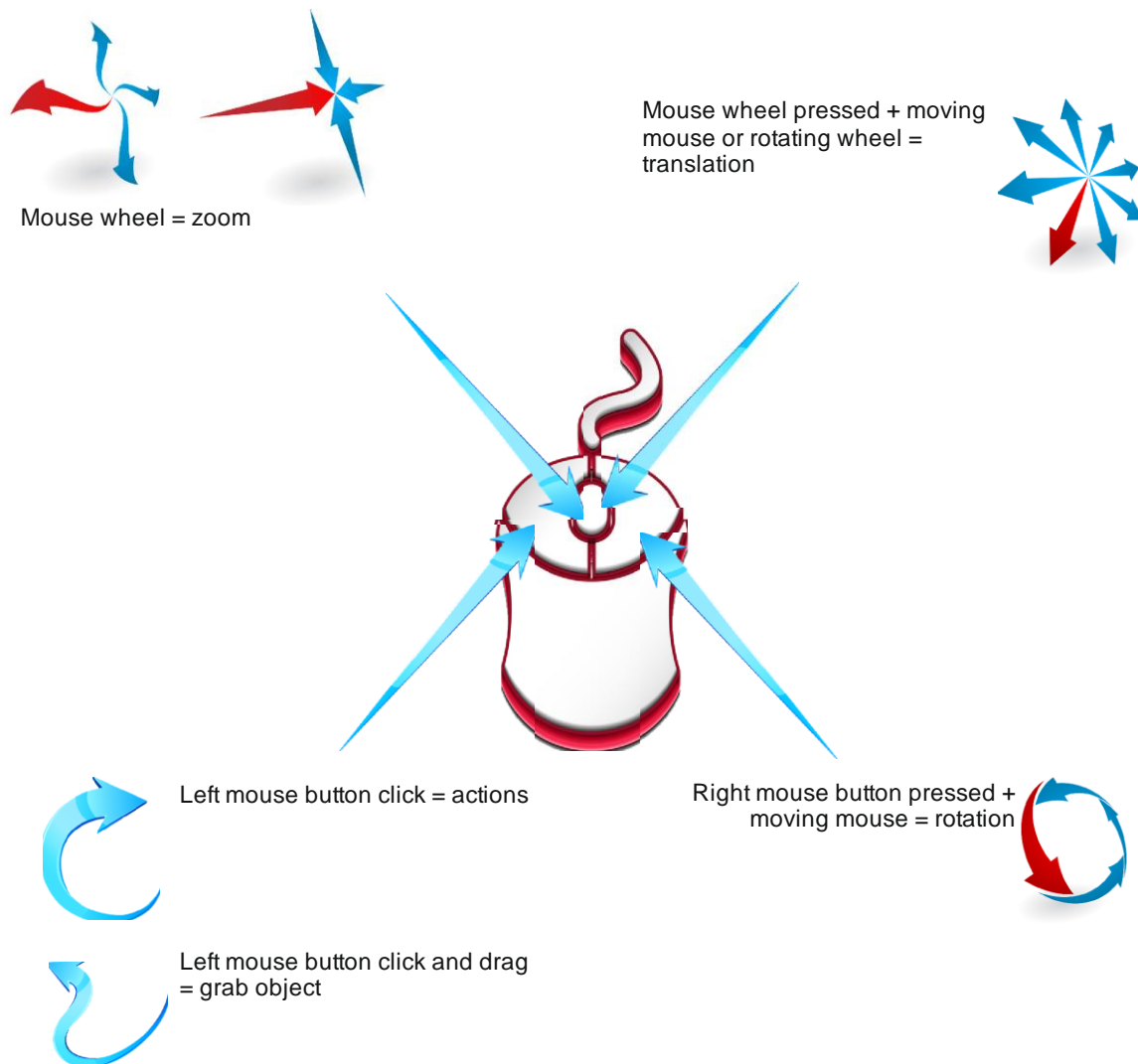
Entrée d'un texte au clavier : 

Sélection dans une liste : 

Introduction

This version 2 tutorial is an evolution showing the importation of Solidworks constraints to speed up the conception time.

Reminder on navigation in the 3D world



Files

The files used in this tutorial are available from our web site.

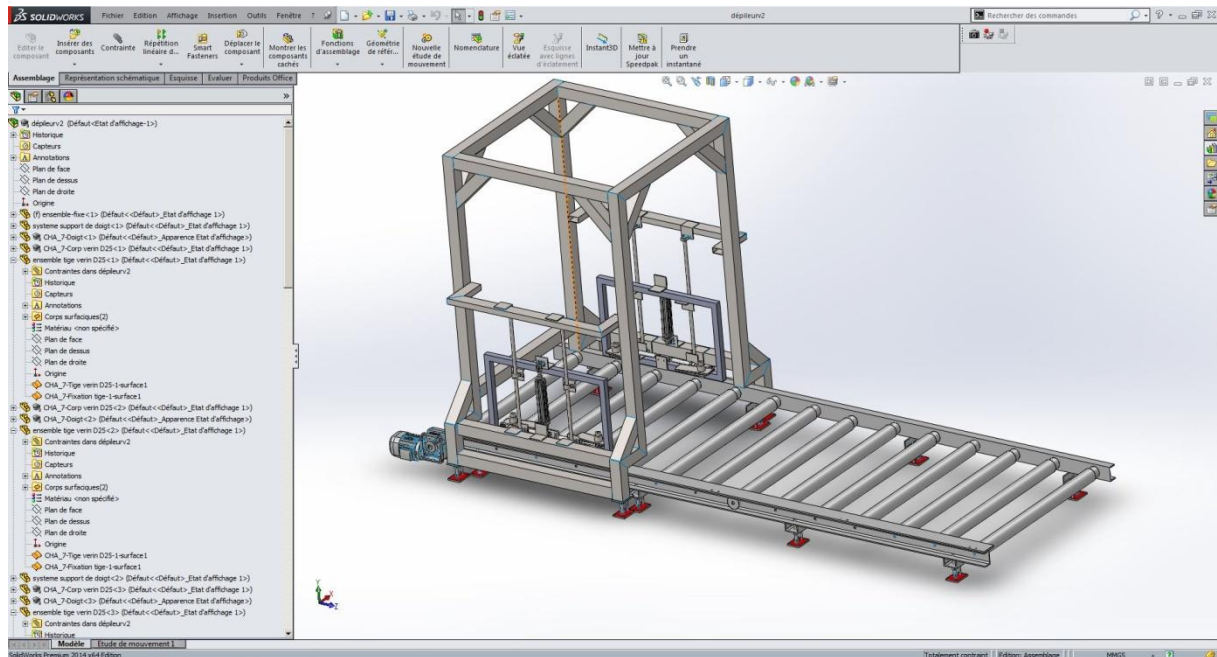
Les fichiers utilisés dans ce tutorial sont disponibles au téléchargement sur notre site Internet. The project being created has been saved in different stages identified by an index number in the file.

In this manual, the various save points are identified by a tracking # with <n> <n> = index, eg **#3 refers to file unstacker#3.vu**

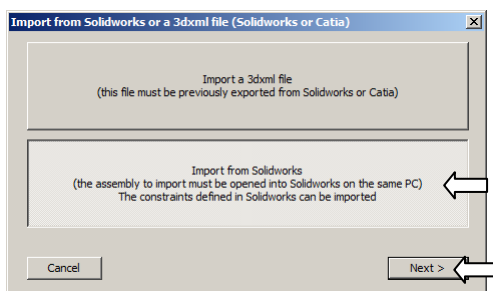
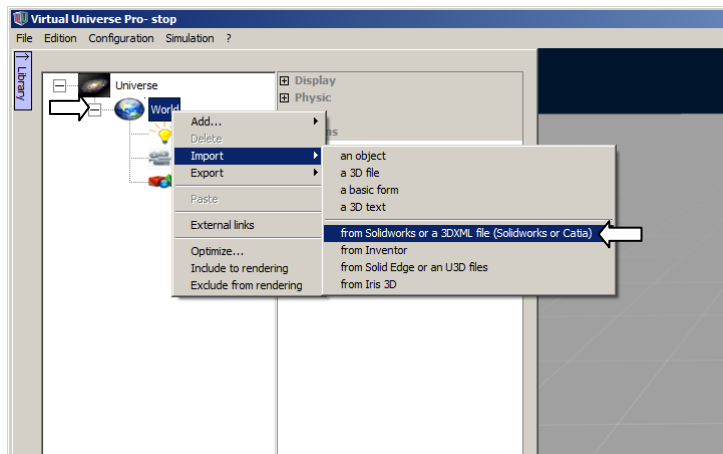
Tutorial

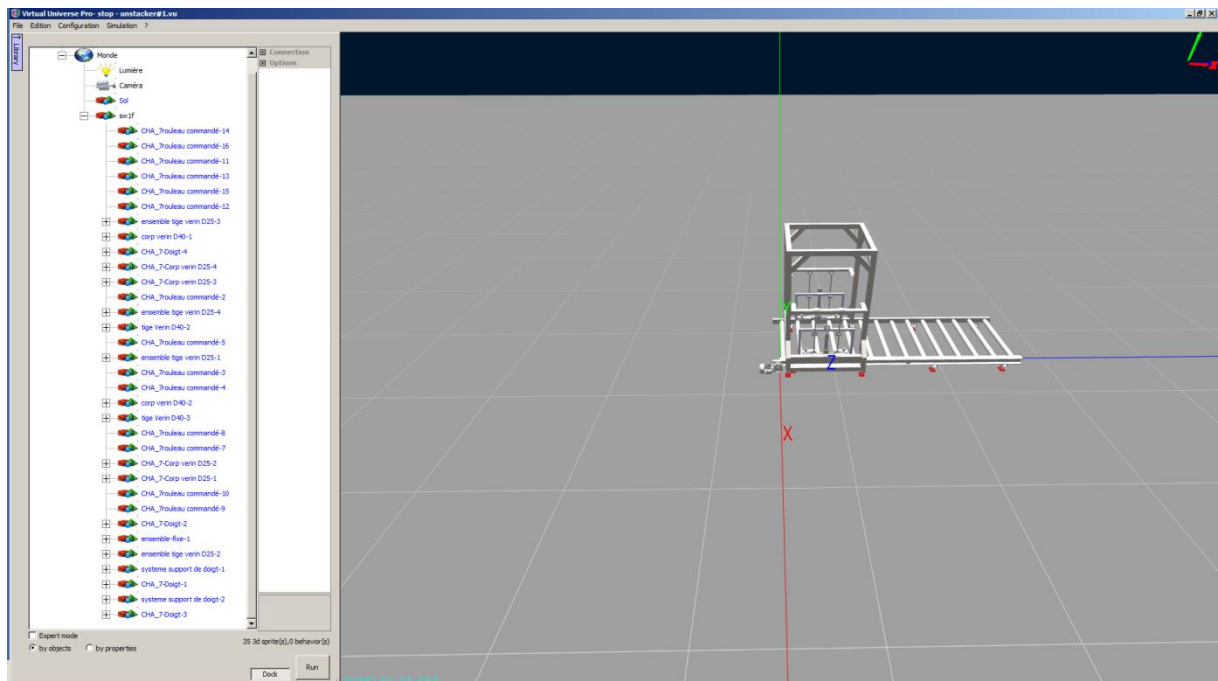
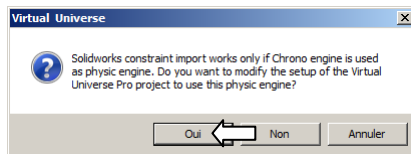
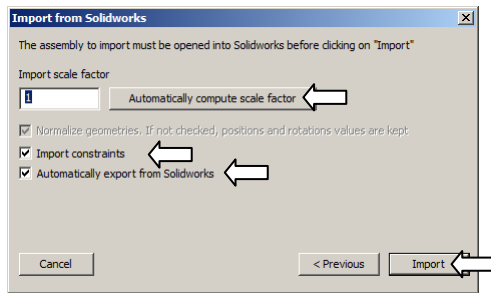
1- Transfer of the Solidworks model to Virtual Universe Pro

1.1 - Opening the full assembly of the model from Solidworks



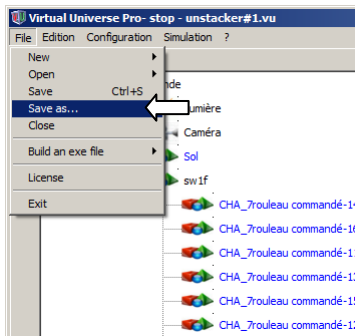
1.2- Importing to Virtual Universe Pro



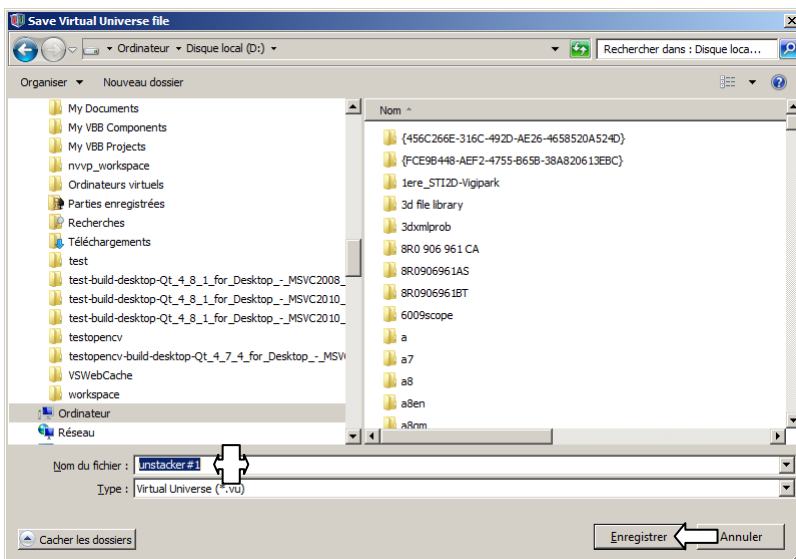


2- Saving the Virtual Universe Pro file

2.1- Saving



2.2- Define file name



Tip: including # 1, the index (the number behind #) is automatically incremented for each backup allowing easy back to a previous version if mishandled. Remember to save regularly in the creation phase of a project.

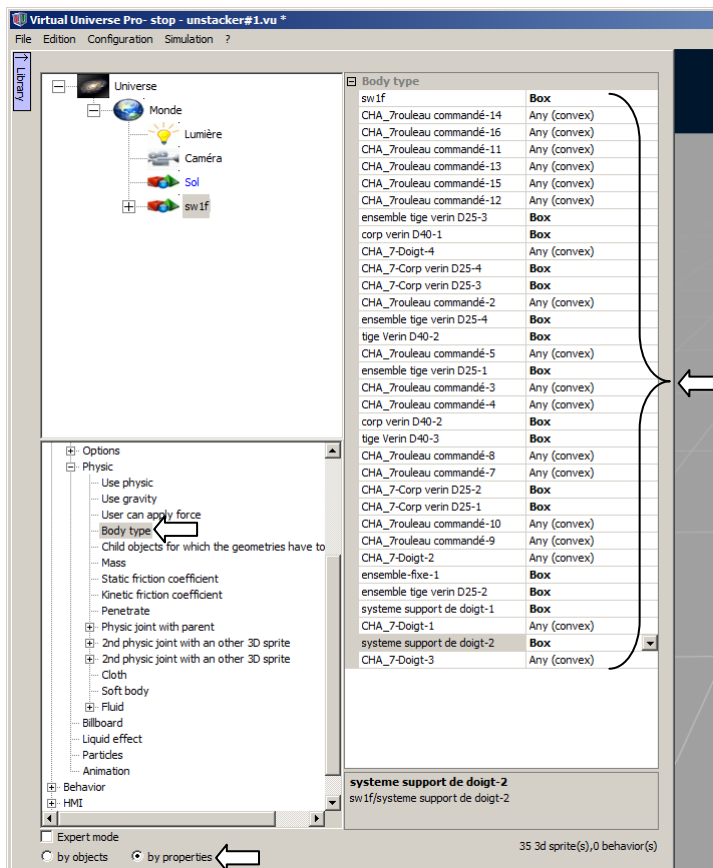
#1

3- Model creation

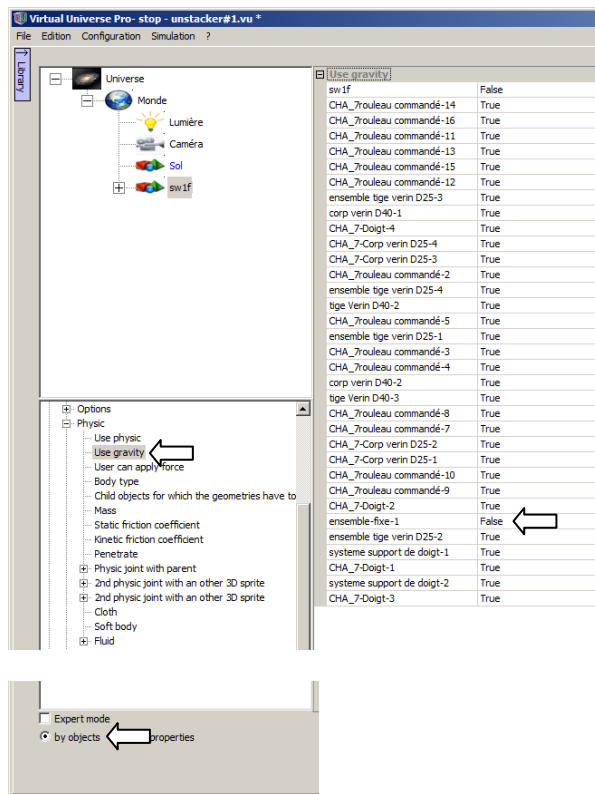
3.1- Defining body types

Select "Any (convex)" for the objects for which this type is essential (for rollers by example).

On utilisera le type "Quelconque (convexe)" pour les objets pour lesquels ce type est indispensable (pour les rouleaux par exemple). By choosing the "box" type for the other items, it improves the performance of physic engine.



3.2- Disable gravity on fixed part.

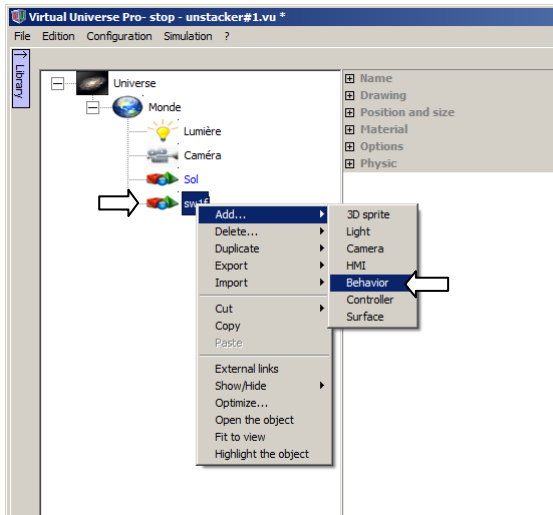


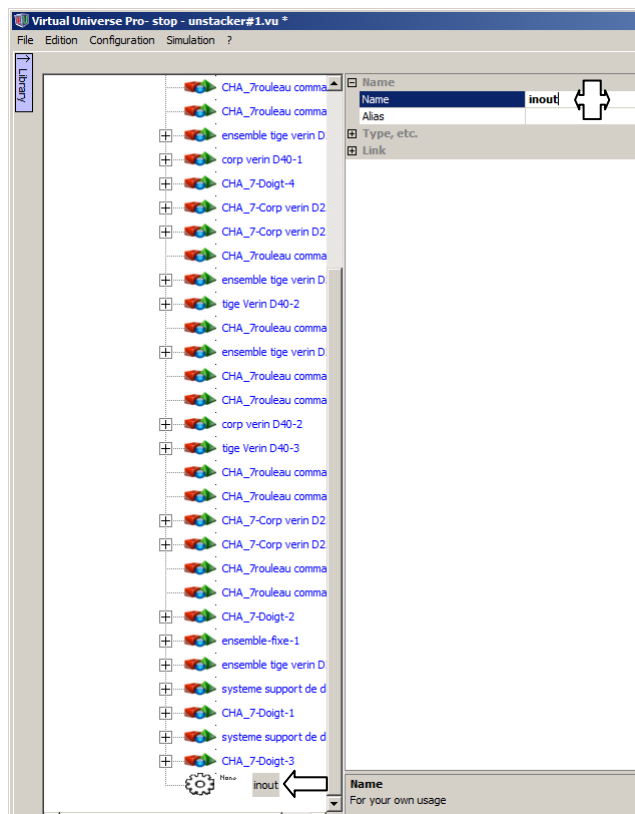
#2

3.3- Setting up

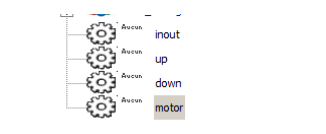
3.3.1- Creating driving behaviors

We are going to create behaviors for centralizing actuators control (one behavior to control several actuators): an "inout" behavior to extend or retract fingers, "up" and "down" behavior to raise or send down the fingers mount, and a "motor" behavior to spin the rollers.





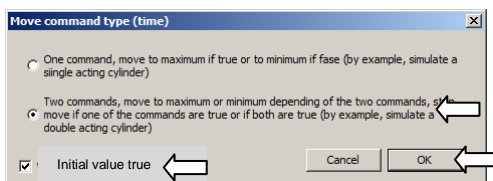
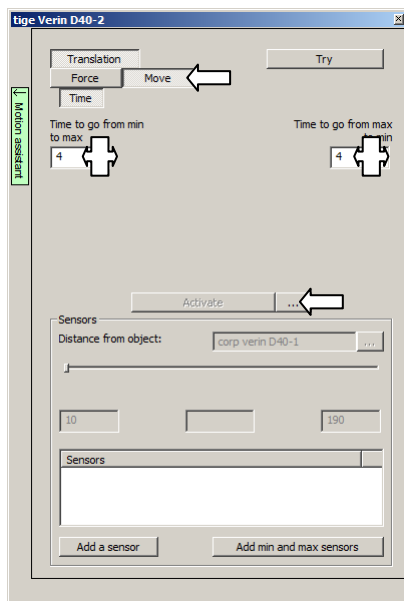
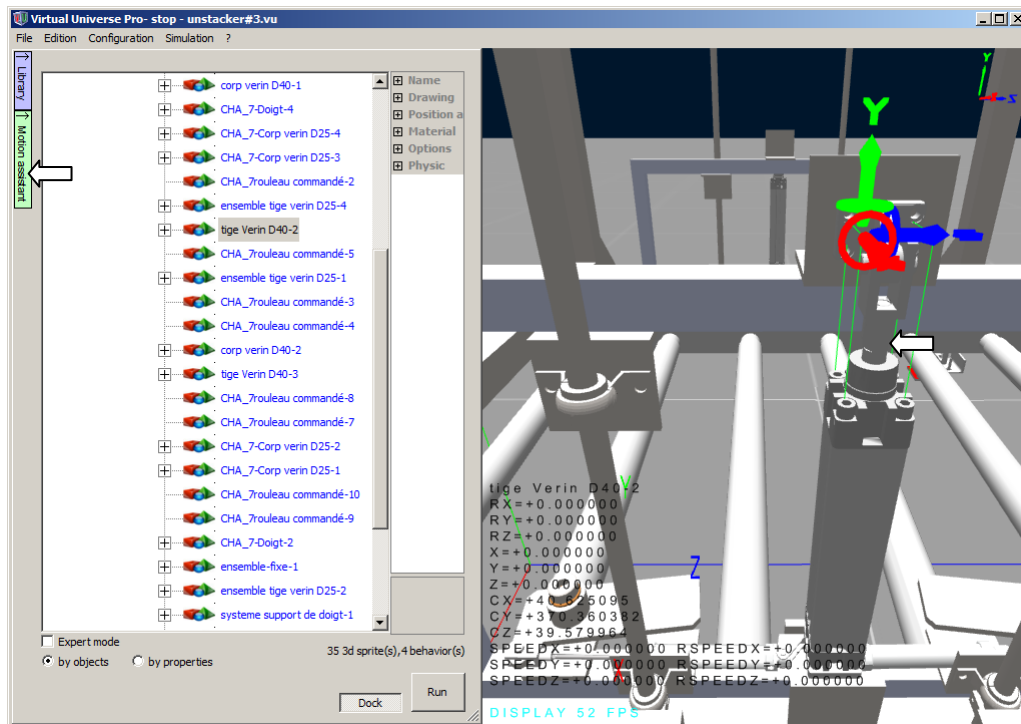
Do the same for other behaviors:



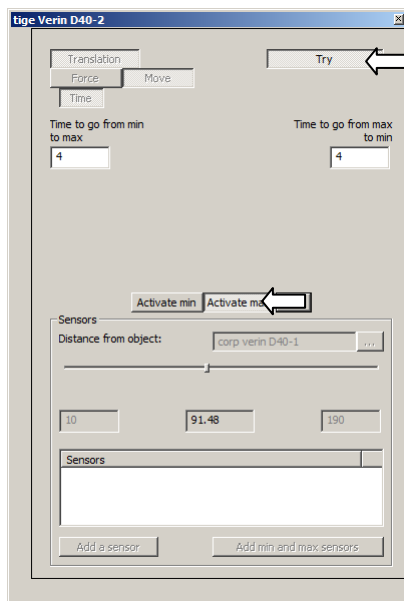
#3

3.3.2- Setting up up and down moves

Click on the rod of one of the vertical cylinder and then on "Motion assistant":



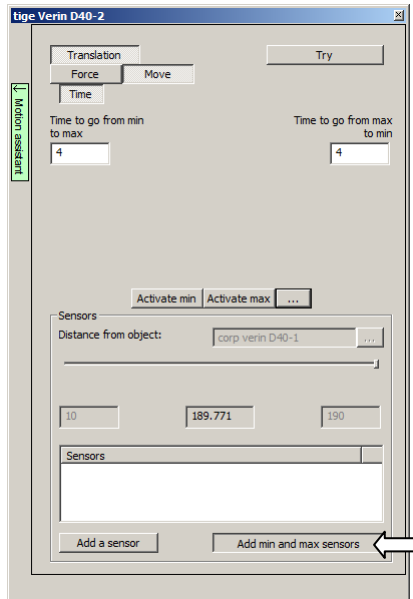
You can click on "Try" to make a test of the move (the course is the one defined into Solidworks constraints). By clicking on "Activate max" and "Activate min", the move is processed respectively to the top and to the bottom.



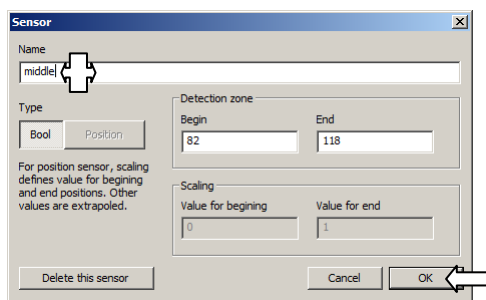
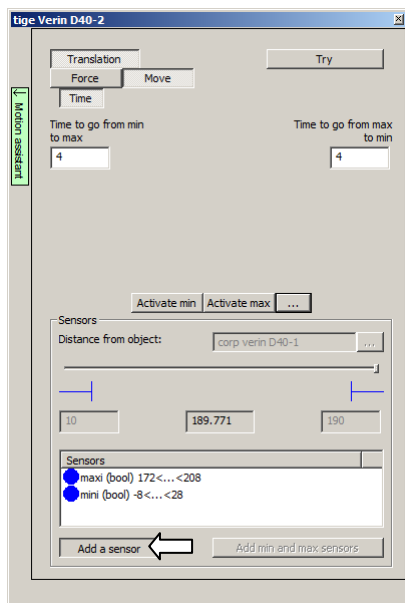
Another click on "Try" ends the test.

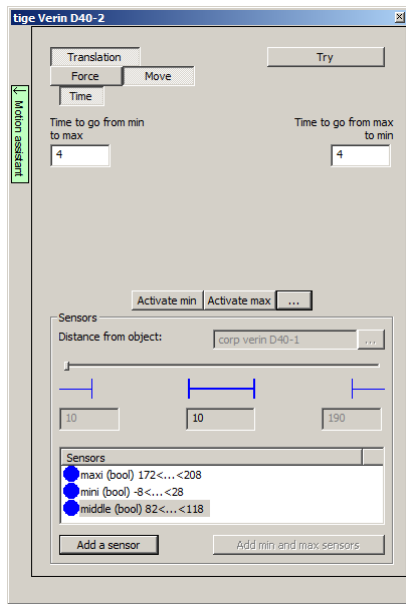
3.3.3- Creating sensors associated with the up / down move

The min and max sensors:

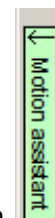
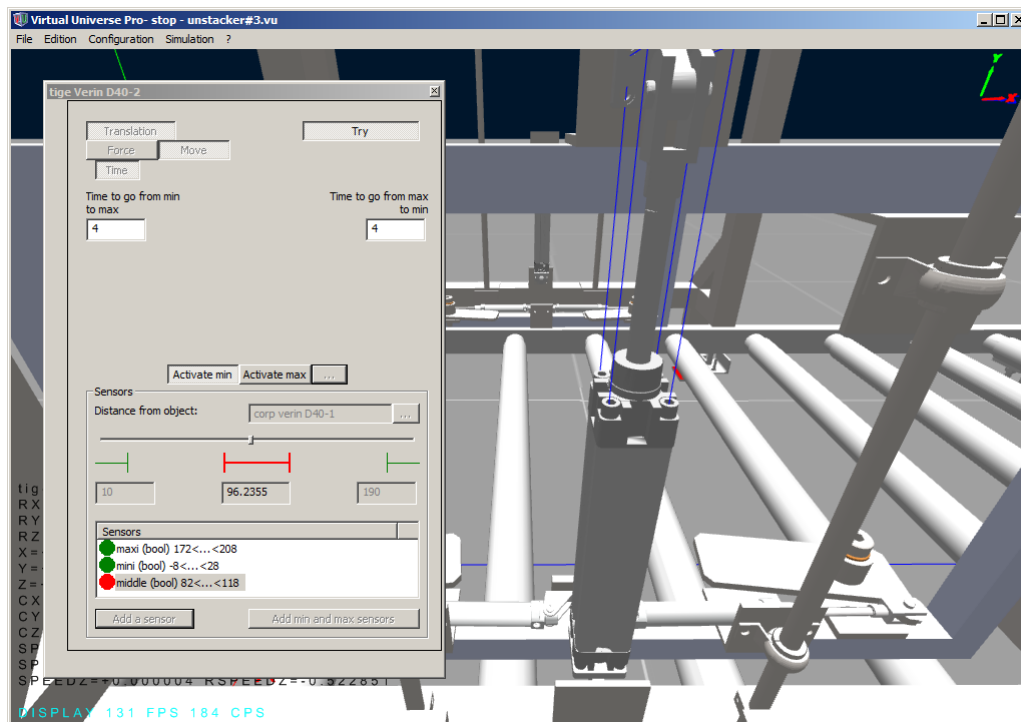


The intermediate position sensor



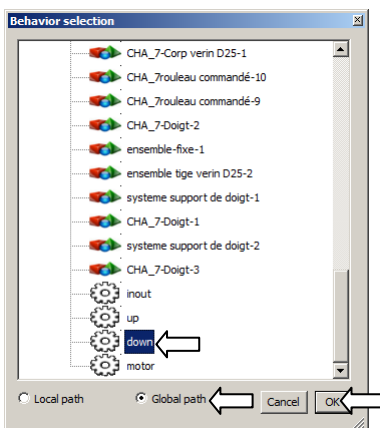
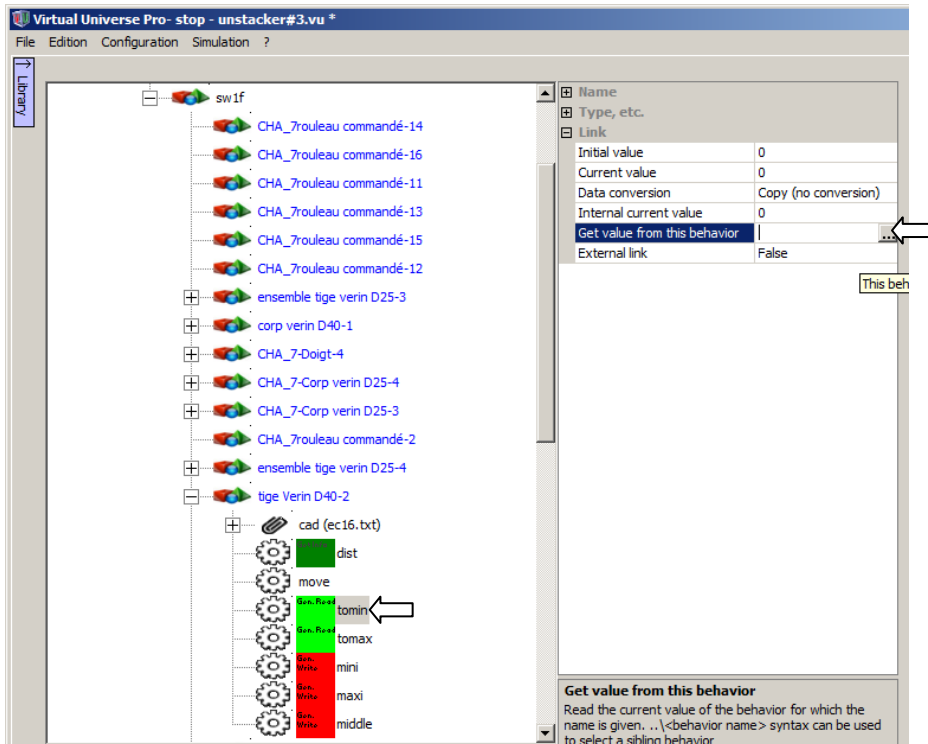


You can possibly check the sensors job by clicking again on "Try":



To exit the wizard, click again on "Try" (if a test is in progress) and then on

3.3.4- Creating a link with the "up" and "down" behaviors



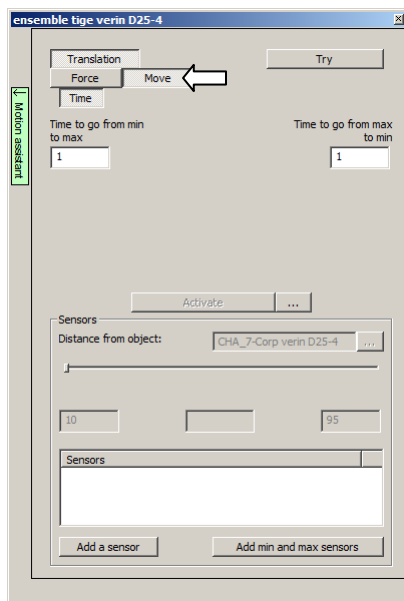
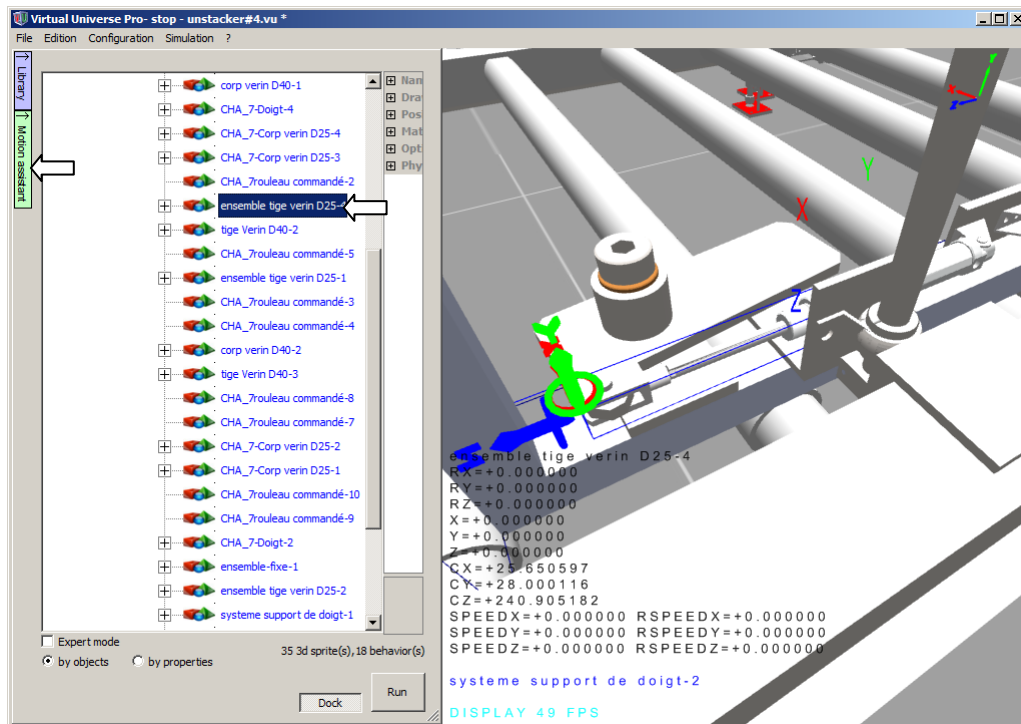
Do the same to associated "tomax" to "up".

Do the same for the other vertical cylinder.

#4

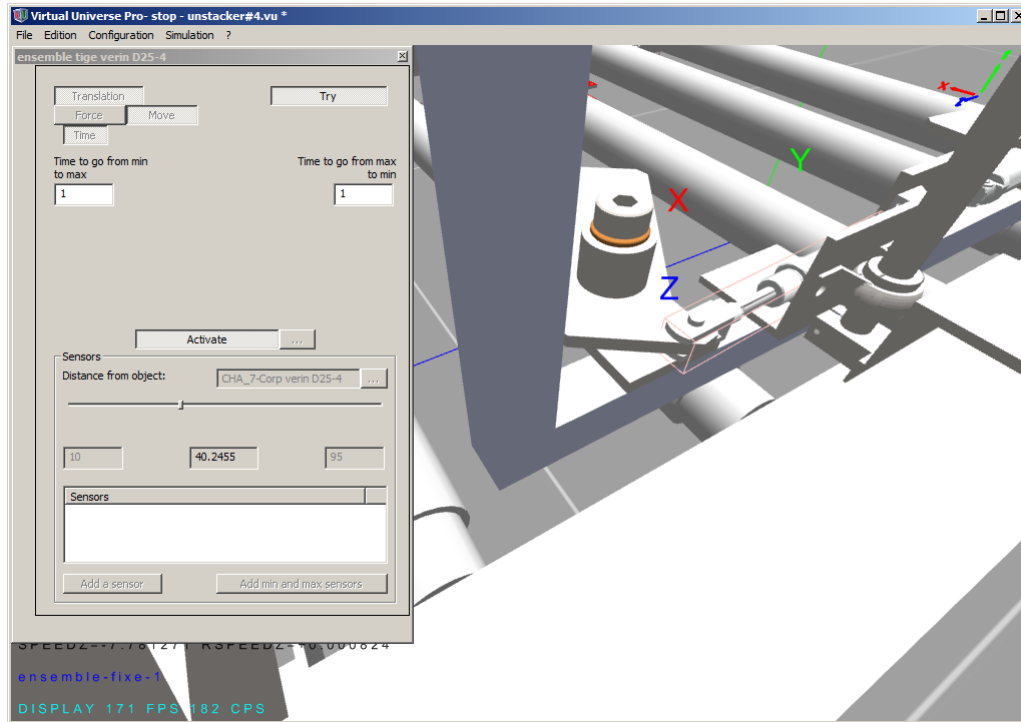
3.3.5- Setting up fingers moves

Click on the rod of one of the cylinders associated with the fingers, then click on "Motion assistant":



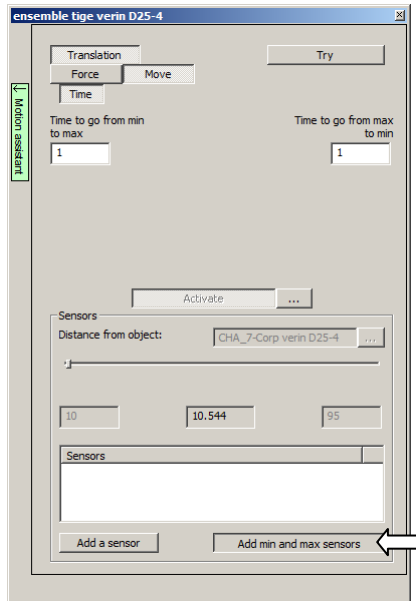
You can click on "Try" and then to "Activate" to make a test of the move (the course is the one defined into Solidworks constraints):

You can click on "Try" to make a test of the move (the course is the one defined into Solidworks constraints).

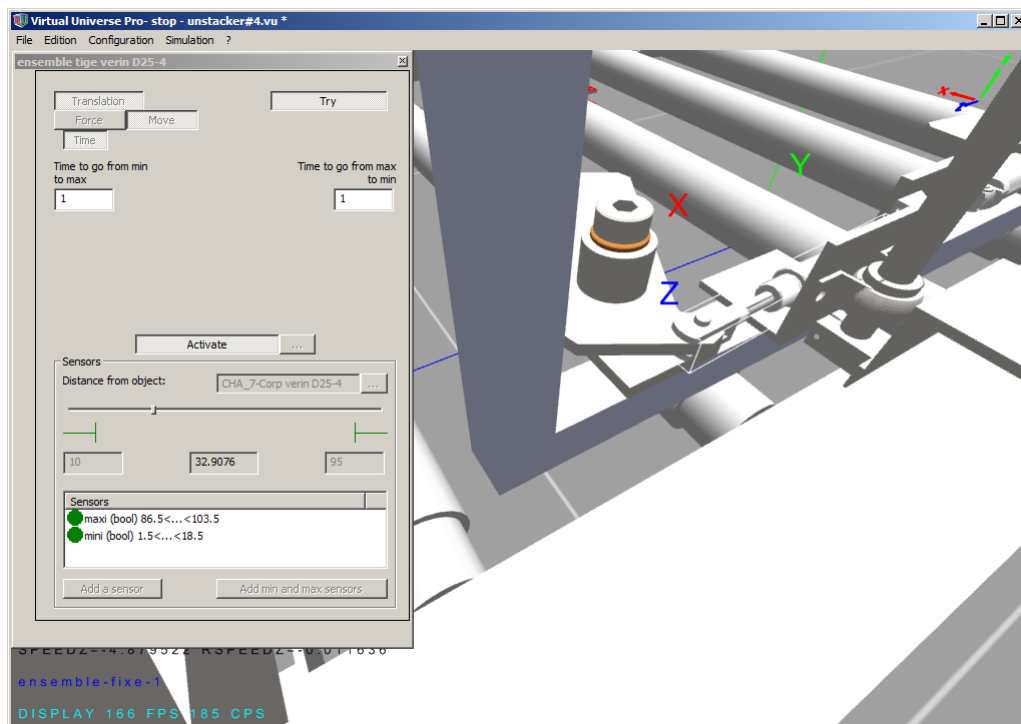


Another click on "Try" ends the test.

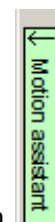
3.3.6- Creating sensors associated to the fingers move



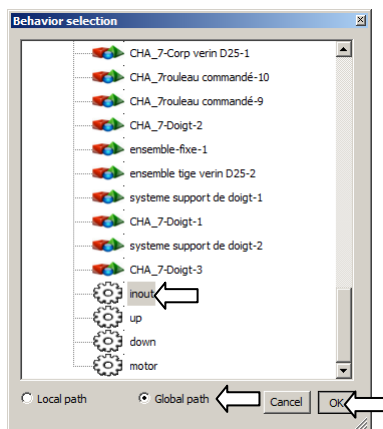
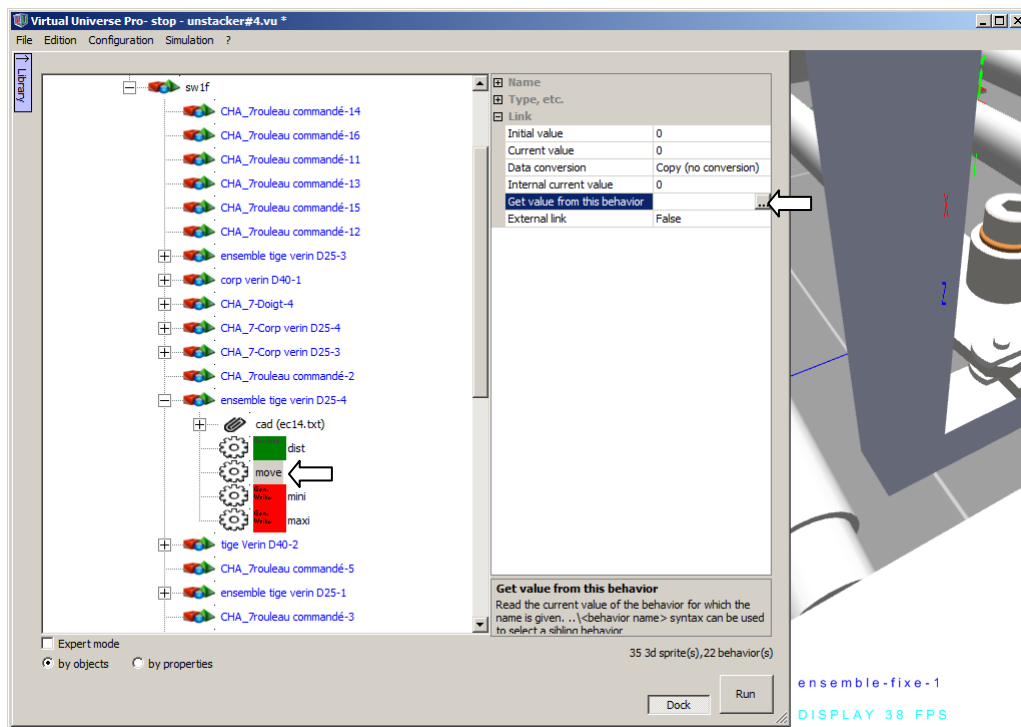
You can possibly click on "Try" to test the sensors job:



To exit the wizard, click again on "Try" (if a test is in progress) and then on



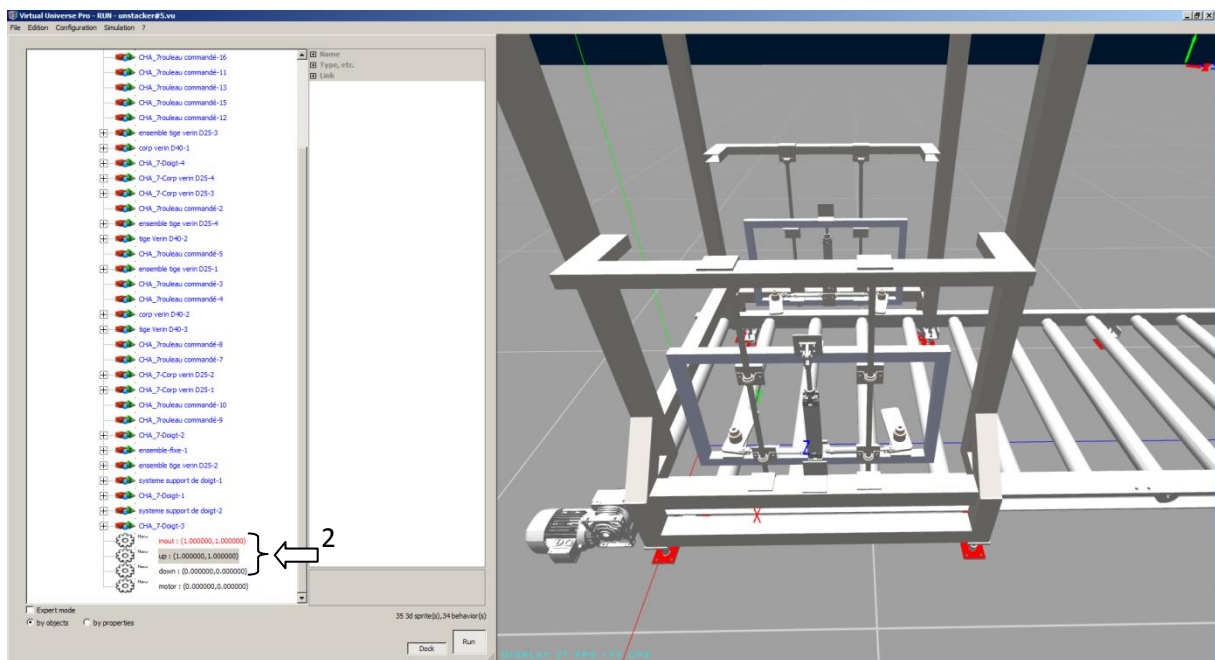
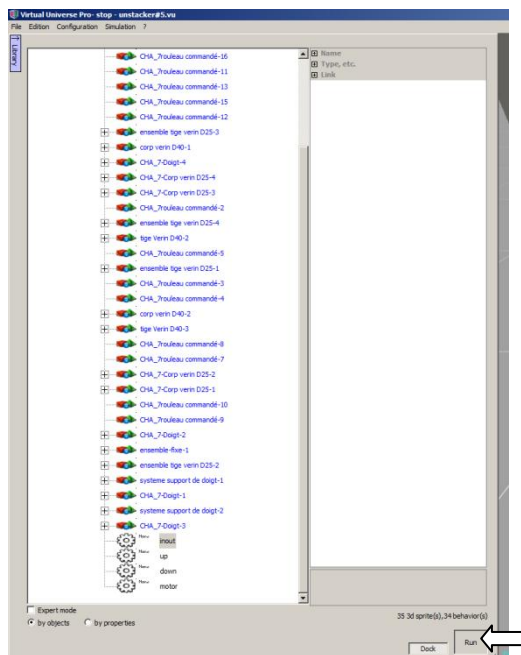
3.3.7- Creating a link with the "inout" behavior



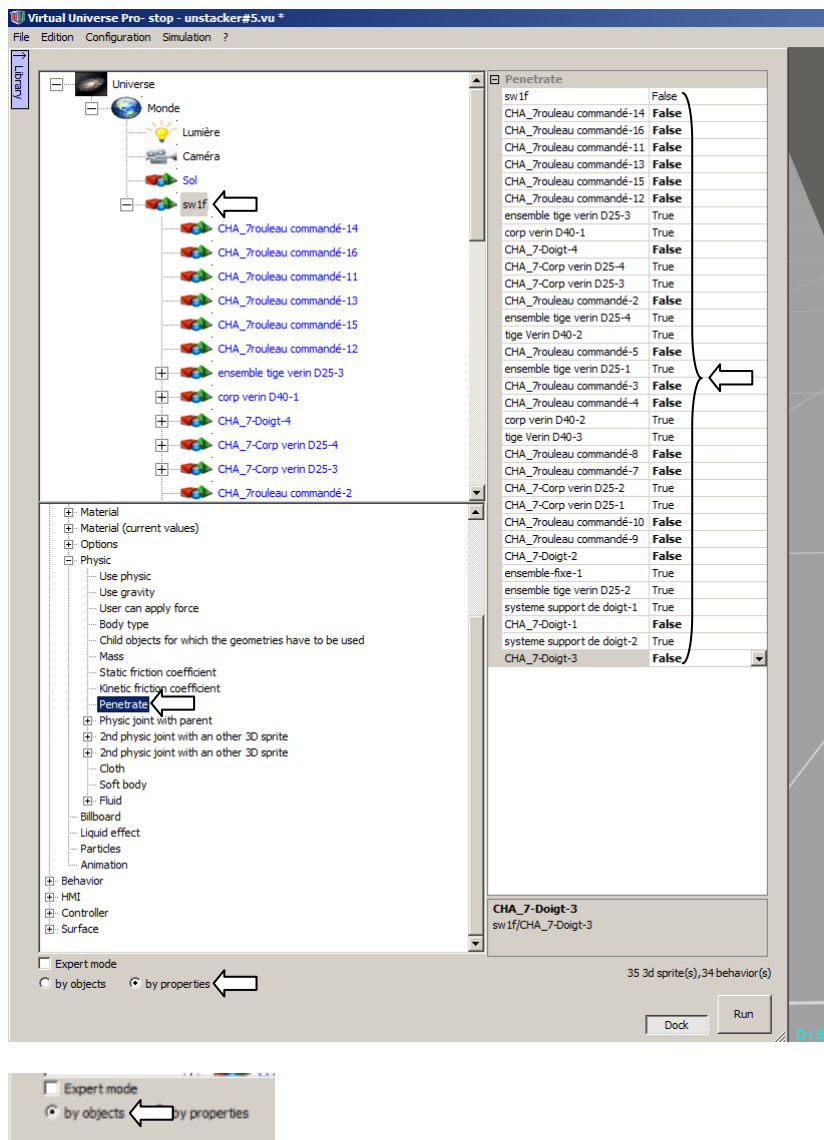
Do the same for the other three fingers.

#5

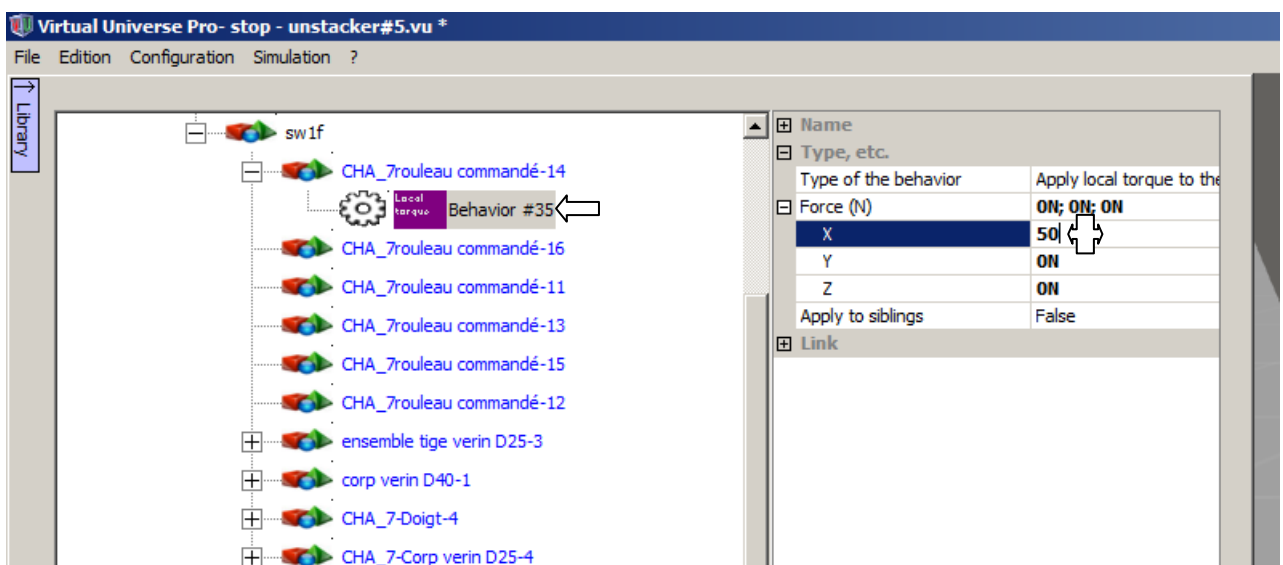
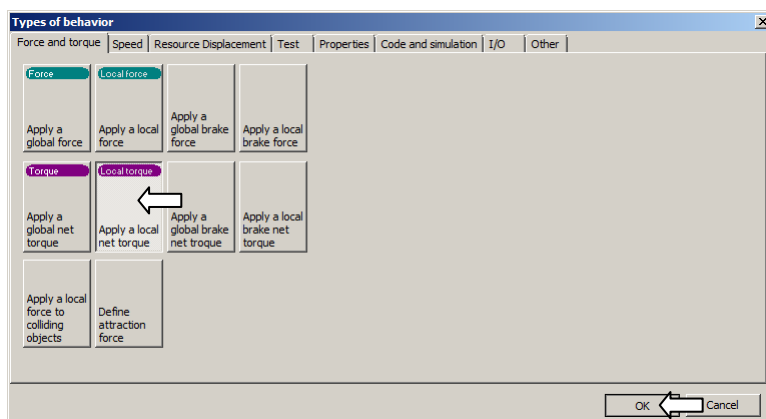
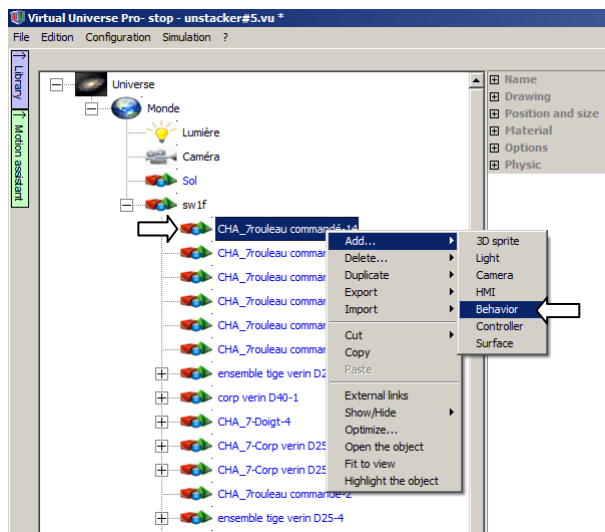
At this point, you can test the defined movements:



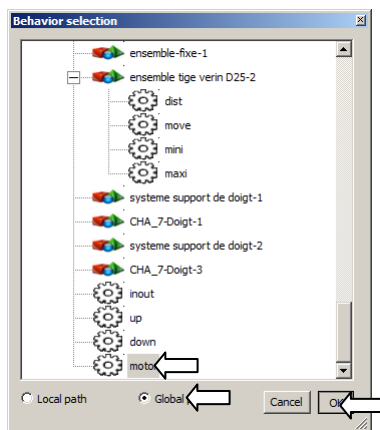
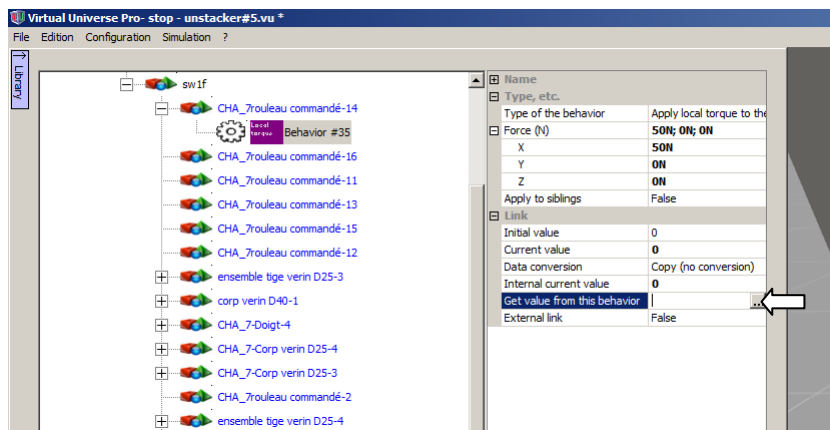
3.3.8- Setting contacts for rolls and fingers



3.3.9- Setting the rollers motors

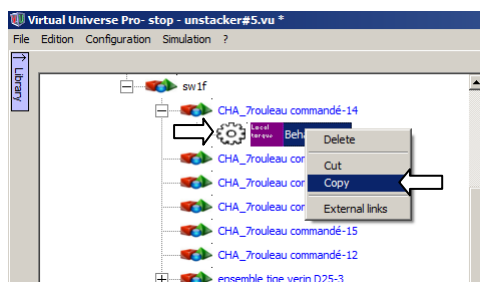


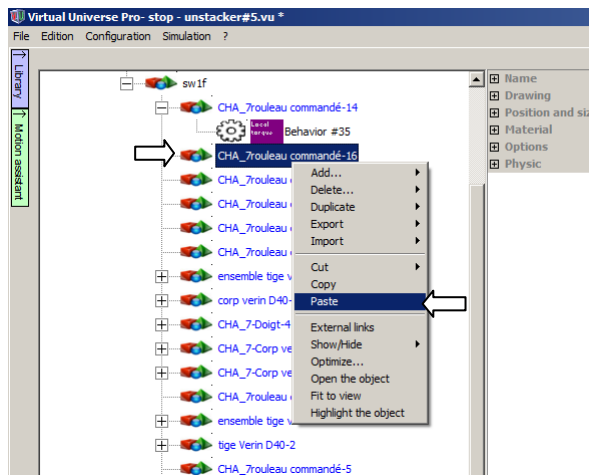
3.3.10- Creating a link with the "motor" behavior



Do the same for other rollers.

Tip: You can directly copy and paste the behavior to other rollers:

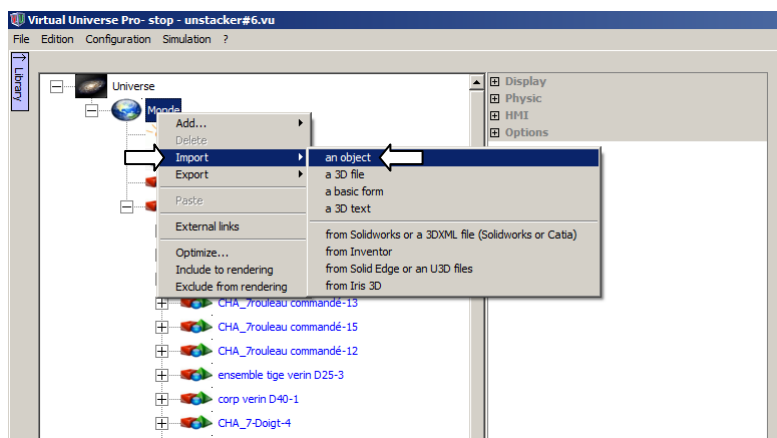


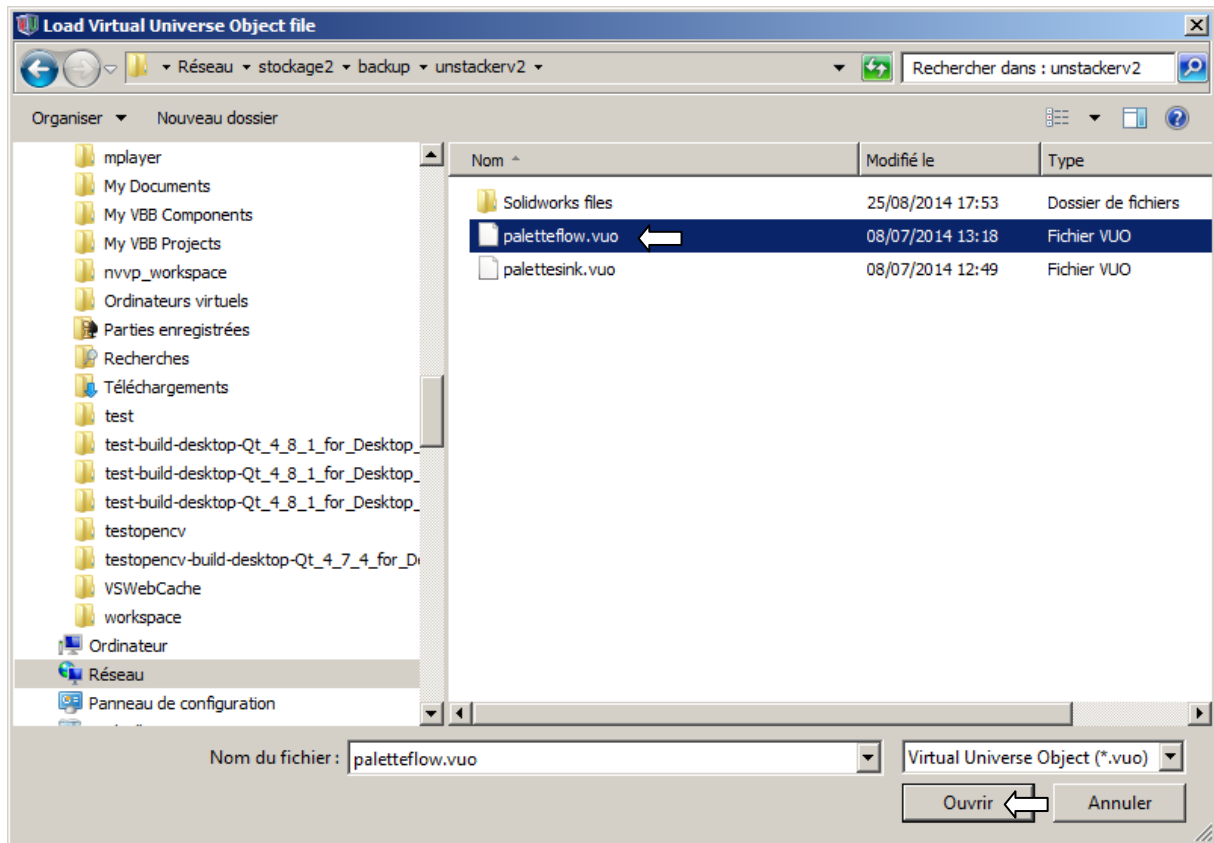


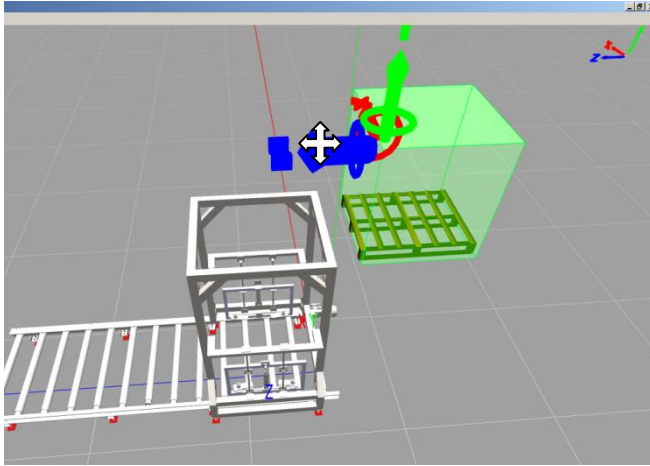
#6

3.4- Placing palettes

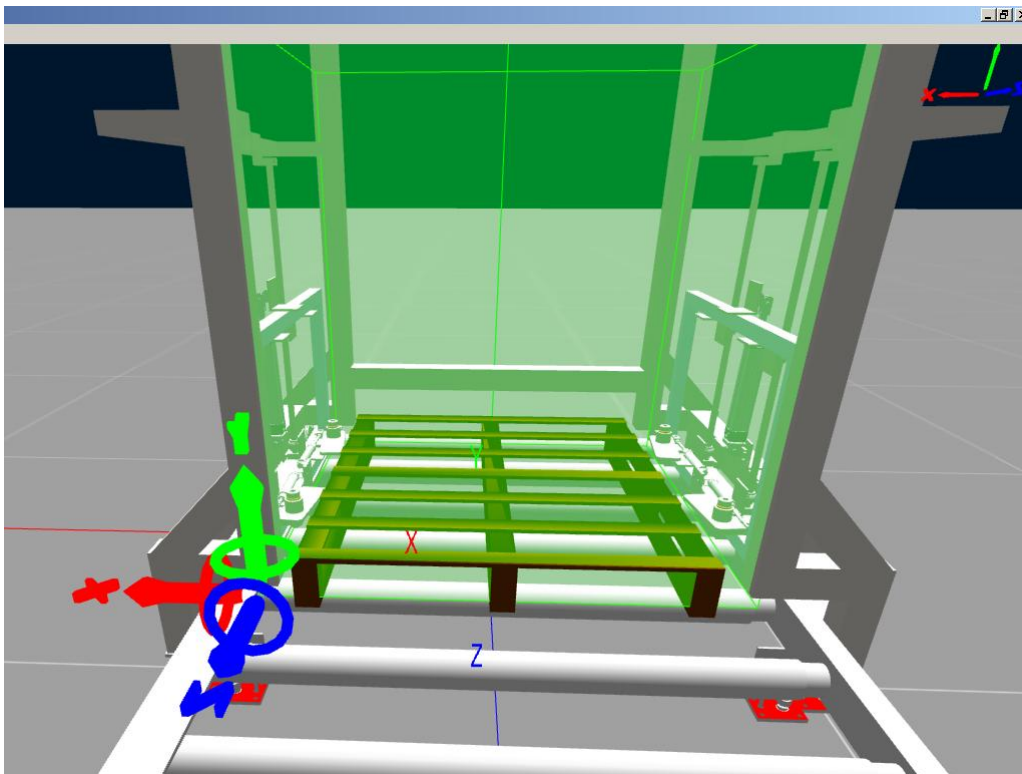
For details about the creation of the "palettes" object, thank you to refer to the tutorial V1. Here, we will simply insert an object "palette flow" and "palette sink" These two objects are used respectively to inject palettes in the 3D world and collect them (back to the source).





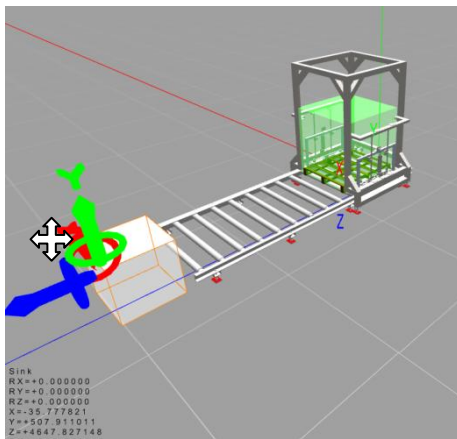


Click and drag the arrow triad to establish the source palette, like this:



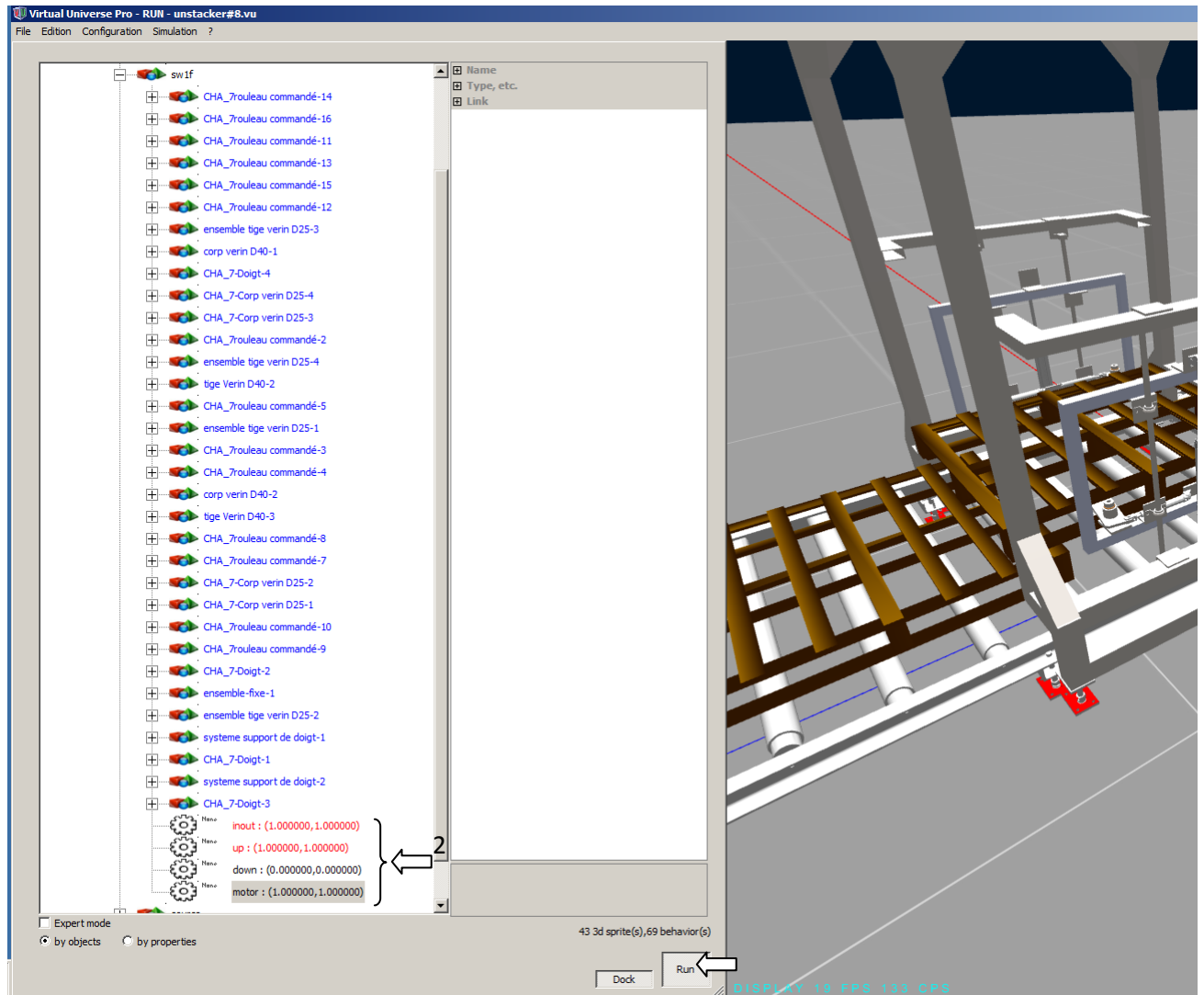
#7

Similarly, install the drain:



#8

At this point, you can simulate the full cycle:



Finally, you can control the simulation from a PLC by combining associating the behaviors to PLC variables or create a program in a virtual controller (#9).