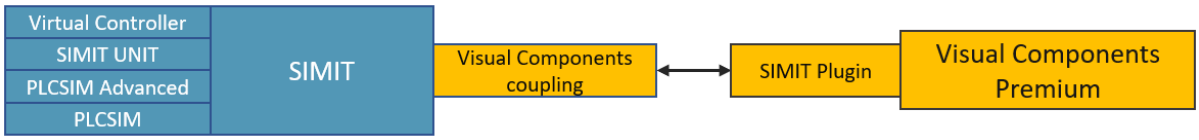
SIMIT connection tutorial

Visual Components 4.3 | Version: January 21, 2021



The SIMIT connection plugin is a new feature introduced in Visual Components version 4.3. This plugin is available only in Premium product. The SIMIT connection plugin in Visual Components used together with the Visual Components coupling in SIMIT allows user to connect to the Siemens SIMIT real-time behavior emulator software.

Required software:

1. Visual Components Premium 4.3
2. Visual Components coupling
3. Siemens SIMIT V10.2 SIMIT SP

External couplings (including Visual Components coupling) cannot be added to SIMIT SP Demo version.

Pre-requisite knowledge:

1. Visual Components basic
2. SIMIT components and charts

In this tutorial, you will learn how to:

1. Add Visual Components coupling to SIMIT
2. Use Visual Components coupling in SIMIT
3. Connect SIMIT and Visual Components

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Introduction

The communication between VC and SIMIT is achieved using two software components.

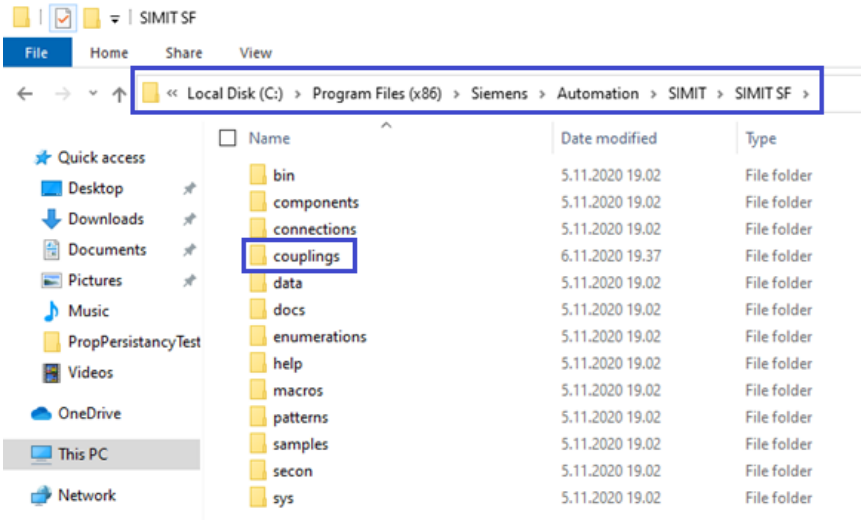
- Visual Components coupling. An external coupling for SIMIT, also called "**VC coupling**" for short.
- SIMIT Connection plugin for Visual Components Premium application, or "**SIMIT plugin**" for short.

Both are developed by Visual Components and are only meant to be used with corresponding versions of each other.

NOTE: This tutorial is limited to show the connectivity between Visual Components and SIMIT. Creating charts in SIMIT software and connectivity between other SIMIT couplings are not shown.

Adding VC coupling to SIMIT

1. In the PC in which SIMIT software is installed, go to this path, C:\Program Files (x86) \Siemens\Automation\SIMIT\SIMIT SF
2. Create folder called ***couplings***



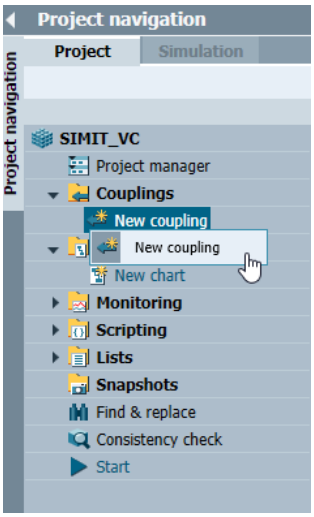
The coupling's folder under "*couplings*" defines the name of the coupling in SIMIT software. This name is significant, because it is used as part of the identifier for coupling signals and signals used in SIMIT charts. **So, if the coupling folder name is changed, references to its signals will break.**

3. Download the VC coupling from Visual Components downloads webpage, https://download.visualcomponents.net/installers/VisualComponents/addons/SIMIT/Visual_Components_SIMIT_coupling.zip
4. Extract the *Visual Components SIMIT coupling.zip* file. You will have *Visual Components* folder. This folder contains necessary files for VC coupling.
5. Move the extracted *Visual Components* folder to the ***couplings*** folder. You may also want to define a shorter coupling name than "*Visual Components*" because the signals in SIMIT charts show this coupling name first and then the signal name if there is space. For example, change the folder name to "*VC*"

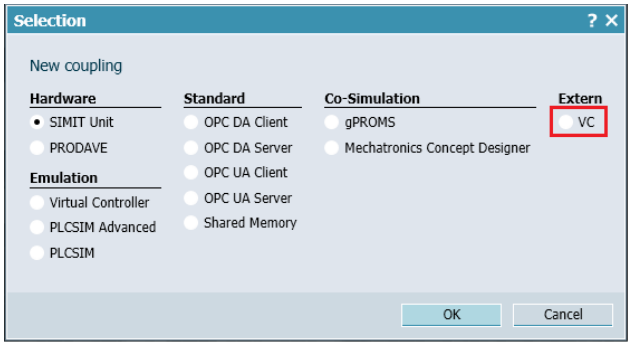
Using Visual Components coupling in SIMIT

1. Launch SIMIT SP application and create a new project. SIMIT SP Demo does not allow to use external couplings.

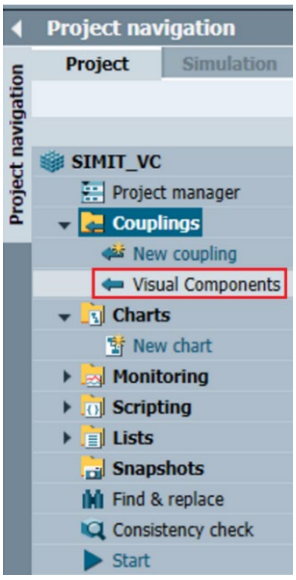
2. From the Project navigation, under your project expand Couplings folder. Right-click on New coupling and select New coupling (or double-click on New coupling)



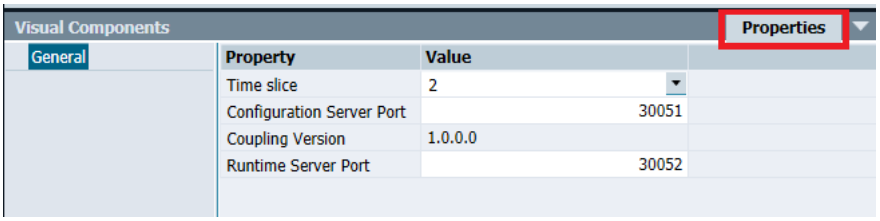
3. This will open the Selection window. Select **VC** under **Extern** and click OK**.** If you have not changed the folder name in couplings folder, then instead of **VC** you will have **Visual Components** as the SIMIT coupling name.



4. The added Visual Components coupling is shown under Couplings.



In the SIMIT property view you can find Visual Components coupling properties

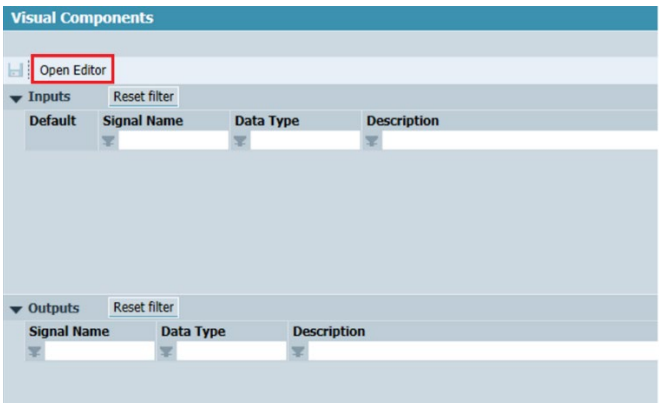


Time slice – Value is the time slice from project properties. There are 8 available time slices for a project. The communication is asynchronous, signal exchange with the coupling should have minimal effect on the real-time execution of your SIMIT simulation.
Configuration Server Port and Runtime Server Port – Ports used to connect to Visual Components application

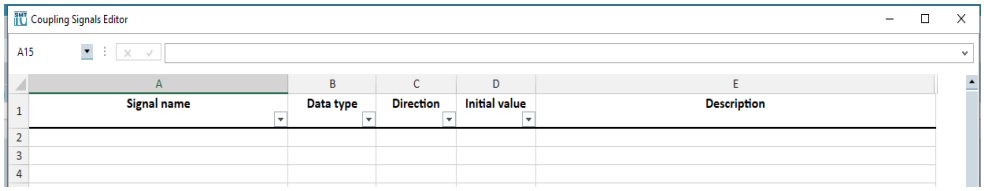
Coupling Version – Visual Components coupling version

NOTE: Configuration server needs to restart when its port number is changed, which causes any connected VC clients to lose connection

5. To add signals in VC coupling, click on Open Editor to open Coupling Signal Editor window



Coupling Signal Editor



Signal name – The name should be unique and not blank

Data type – Accepted simit signal data types are Binary, Integer and Analog (double type)

Direction – Signal values are transferred

- *To SIMIT* – Input signals to SIMIT from Visual Components
  NOTE: These are SimulationToServer variables in Visual Components

- *From SIMIT* – Processed output values from SIMIT to Visual Components
  NOTE: These are ServerToSimulation Variables in Visual Components

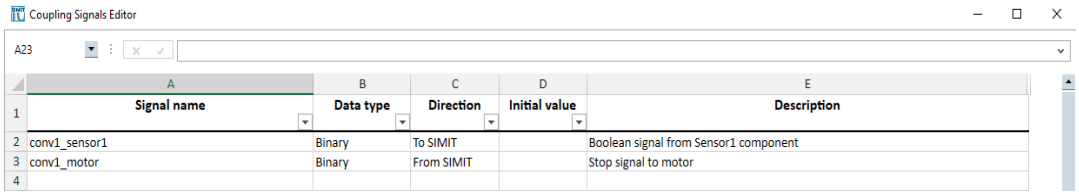
Initial value – Initial value for the signal assigned at SIMIT simulation start

Description – Description for the signal

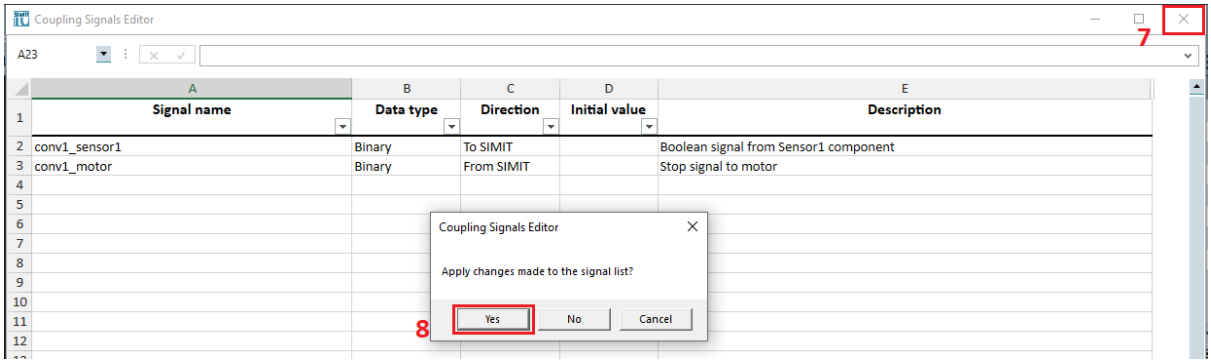
To create coupling signal:

1. Enter the Signal name
2. Select data type
3. Choose direction
4. Set initial value
5. Write description
6. Hit Enter

NOTE: If any cell value is left empty, it will use default values when you close the editor. Also, the names are automatically made unique when you close the editor.



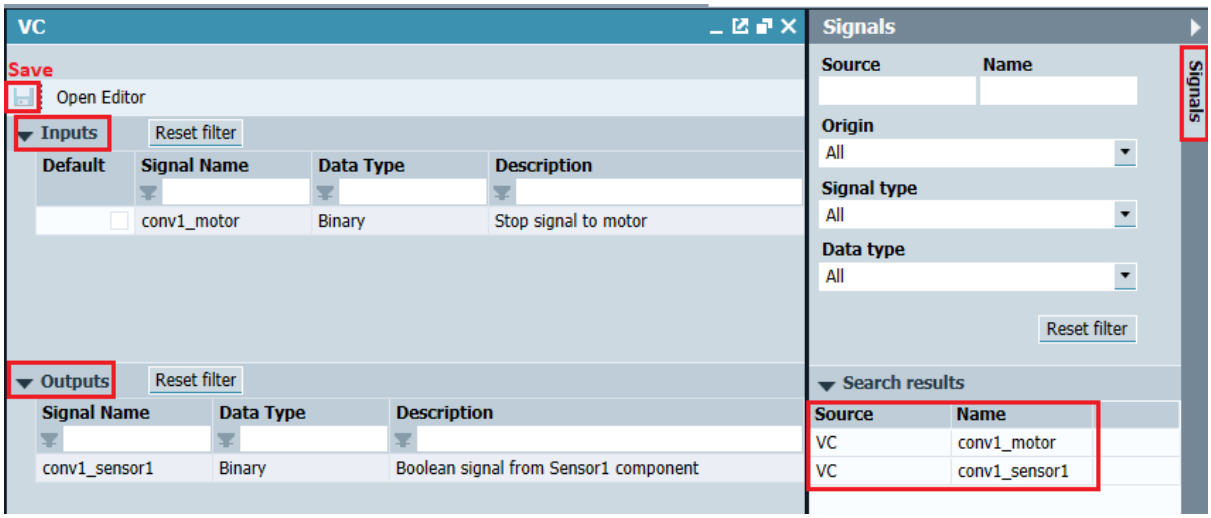
7. Close the Coupling Signals Editor
8. Click 'Yes' to create/update the signal names



Under Inputs you will have the *"From SIMIT"* direction signals and under Outputs you will have the *"To SIMIT"* direction signals

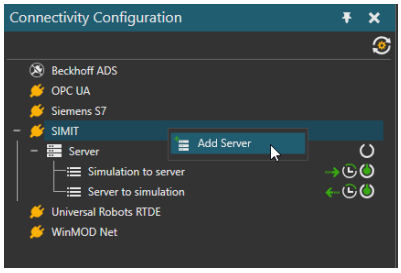
You can find the defined signals under Search results.

NOTE: Whenever you add/remove/modify signals in signal editor, click 'Save' icon to save the changes.



Connect SIMIT plugin and VC coupling

1. Enable the ''Connectivity" addon from the Visual Components Premium backstage and restart the application. In the Connectivity Configuration, select SIMIT and Add Server

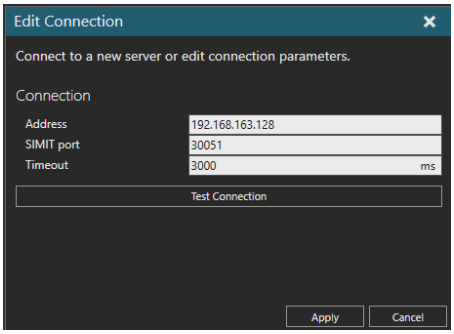


2. From the Edit Connection panel,

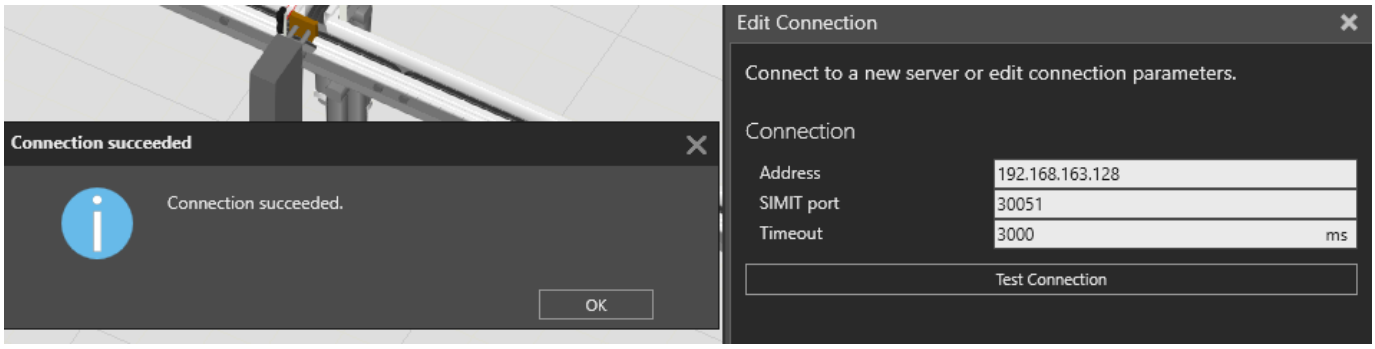
   Address – Enter the IP address of the machine in which the SIMIT environment is running.

   SIMIT port – The Configuration Server port defined in the VC Coupling.

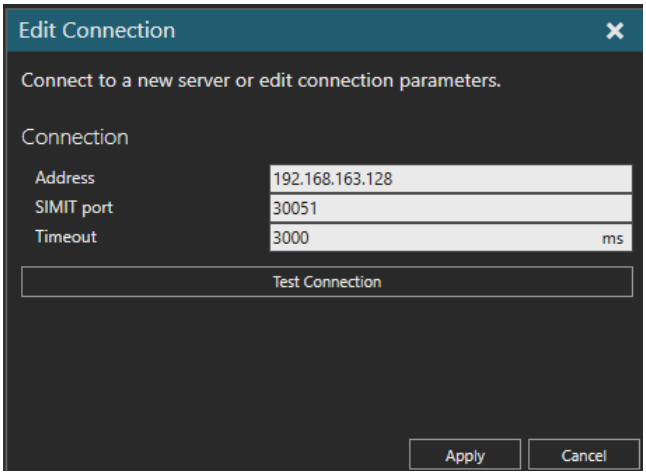
   Timeout – in Milliseconds. Used for initial connect and asynchronous operations.



Select “Test connection” and check if it succeeds. Select “OK”

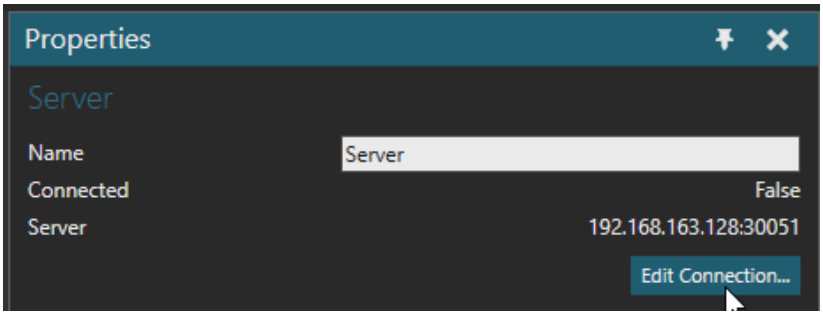


Select Apply to set the SIMIT plugin connection properties.

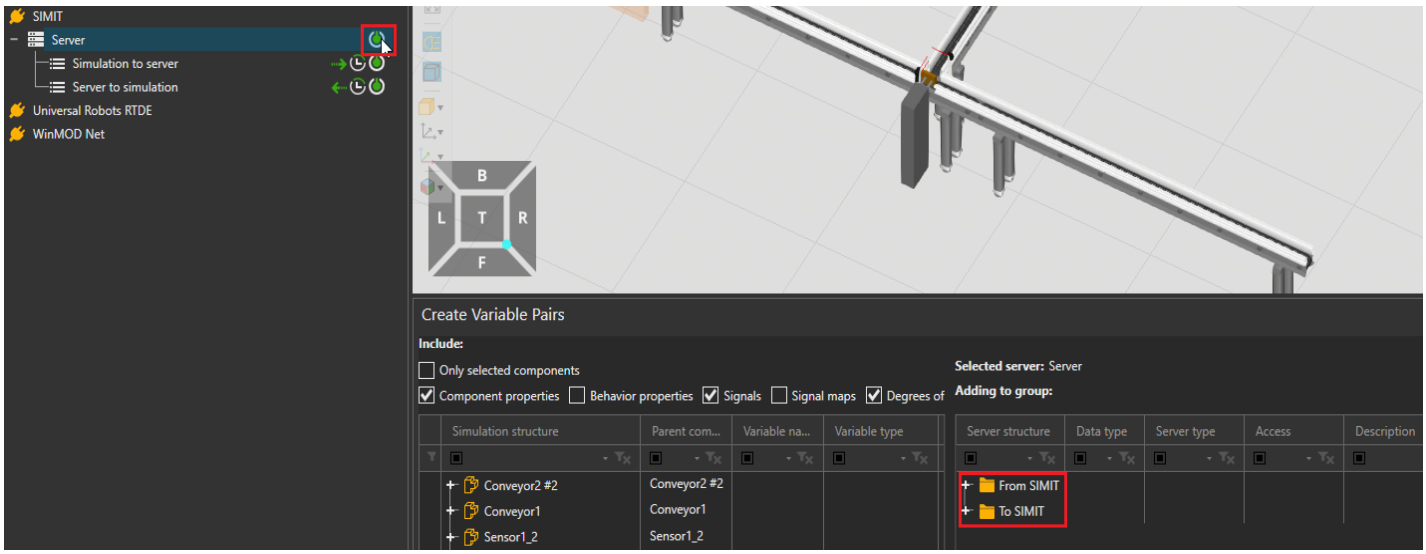


NOTE: Both cyclic and event-based update modes are supported, and the communication is always asynchronous.

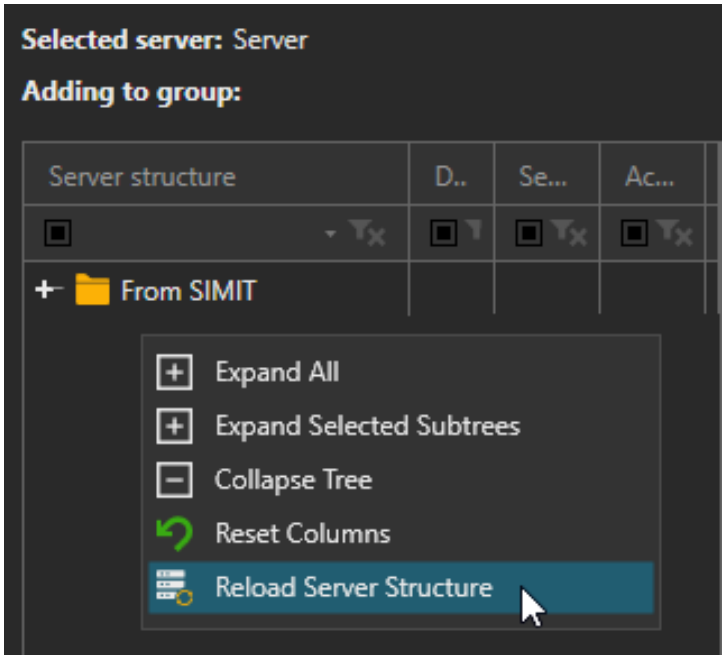
In the future, if you want to edit the server, from the Server properties panel, select “Edit Connection…”



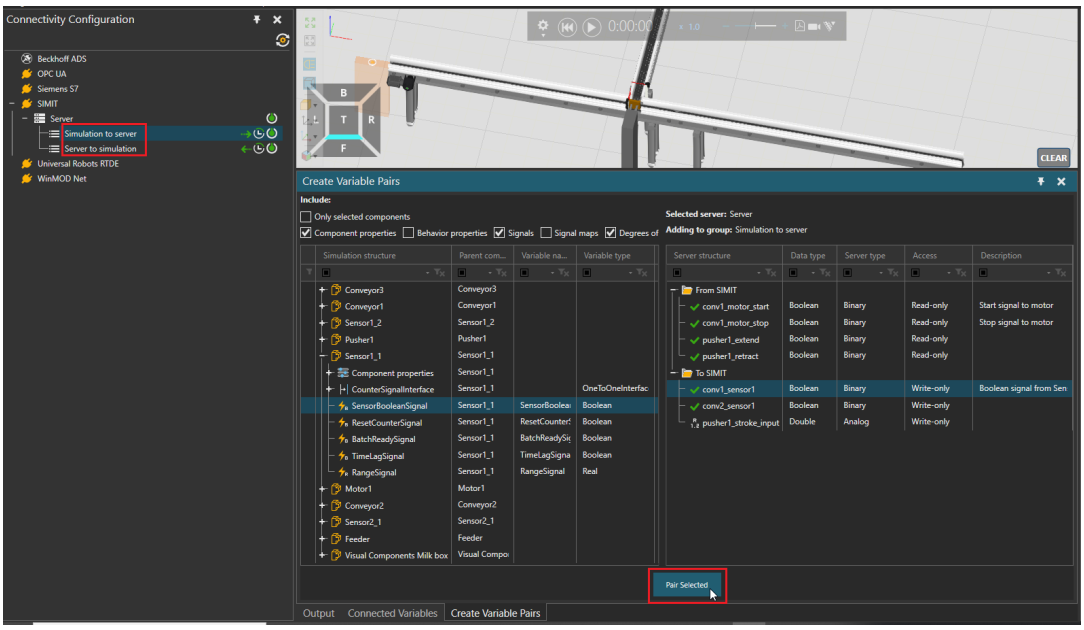
3. Connect the SIMIT plugin server. This will display the “From SIMIT” and “To SIMIT” in the Create Variable Pairs panel



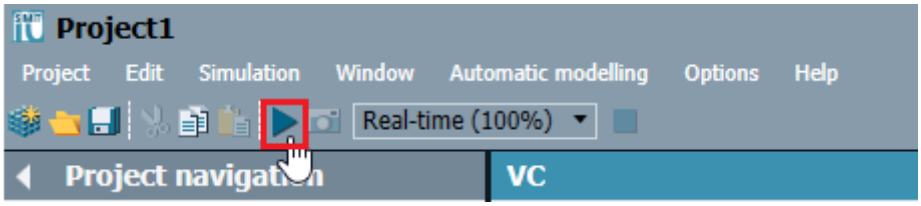
NOTE: If you make any changes in the VC Coupling in the SIMIT environment, right-click on an empty space from the Server structure and select “Reload Server Structure”



4. Select the variable group, “Simulation to server” or “Server to Simulation”. Select the variables to be paired and click “Pair Selected” .

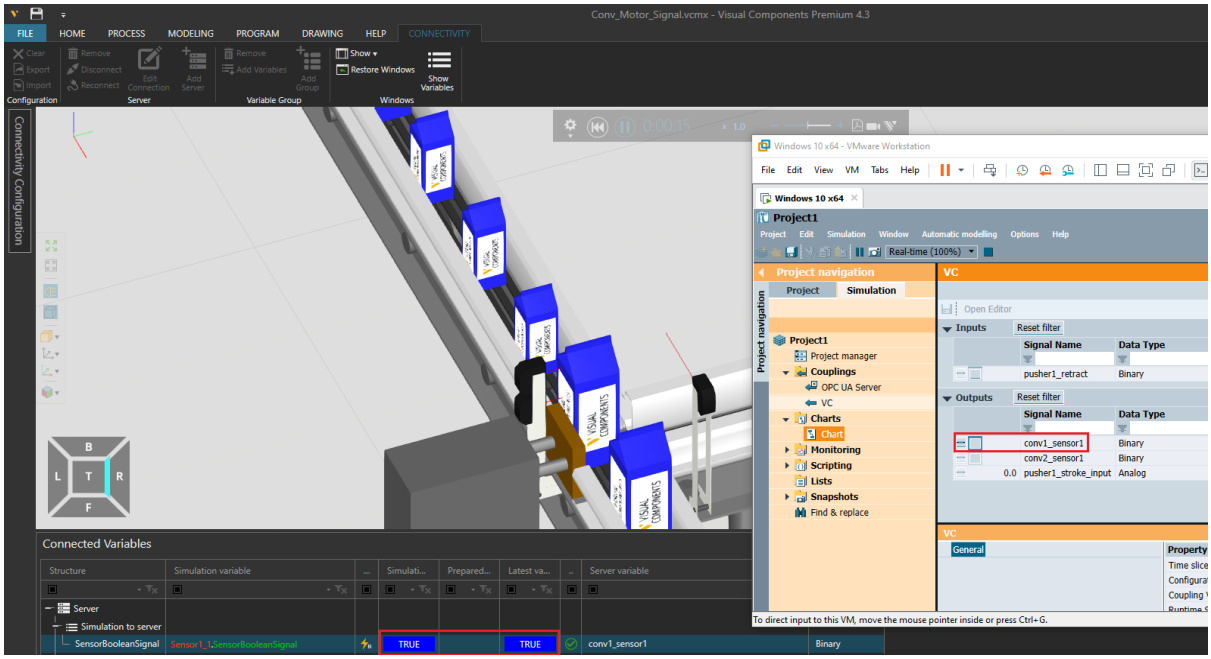


5. “Start” the simulation in SIMIT application.



6. Start the simulation in Visual Components application.

You can see the value changes for the signals paired between Simulation to Server and To SIMIT and signals paired between Server to simulation and From SIMIT



Limitations

- One coupling per project: Users should only add one instance of the Visual Components coupling to a SIMIT project.
- Signals must be defined in the Visual Components coupling in SIMIT software: The signals to be exchanged with Visual Components SIMIT plugin must be explicitly defined in the SIMIT VC Coupling and then connect to the charts.