



# Simulation Mode



## Application Note



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Member of Akribis Systems group

## Revision History

Version	Description	Date
1.0	Initial Release	08 September 2022
1.1	Typo Corrections	18 October 2022

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This product is warranted to be free of defects in material and workmanship and conforms to the specifications listed in this manual, for a period of 12 months from the shipment date from factory.

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## 1 Introduction

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### 1.1 Background

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In setting up a system, it can be risky to test new code or implementations if the system is mechanically fragile or has expensive equipment. In certain cases, the project might demand the development of the software even before the mechanical stage/ motors are even purchased.

At times, a developer might want to refer to certain parameters off-site without the controller beside.

In such cases, it would be convenient to be able to simulate the environment and continue usage with a partial system (without motor, or without controller).

### 1.2 Scope

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There are two main modes of simulation or offline usage.

The first mode is where the user has a computer and controller but no motor. But he would like to try out the features to 'move' the motors. In such a case, it is possible to use a simulation motor.

The second mode is where the user does not have a controller with him, but he would like to write a user program or to look at the PCSuite GUI / parameters.

This application note seeks to explain how to setup and use the controller and PCSuite in the above situations.

## 2 Setup

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### 2.1 Motor Simulation Required Setup

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In the event that the user has access to a controller but not motors.

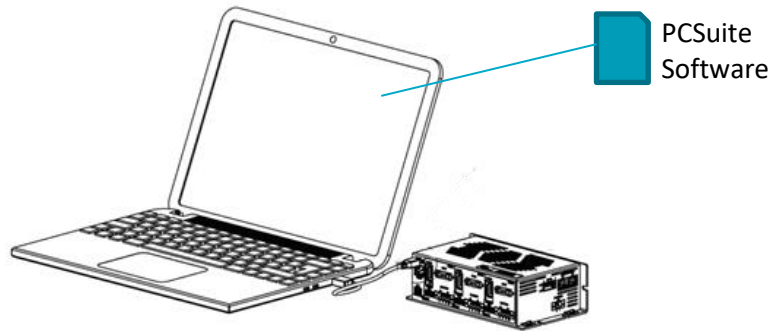


Figure 1. Motor Simulation Setup

The user will need to have Agito PCSuite software installed. The controller can be connected over ethernet or USB. It is always recommended to use an ethernet connection as the communication is faster.

### 2.2 Controller Simulation Required Setup

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In the event that the user does not have access to the controller.

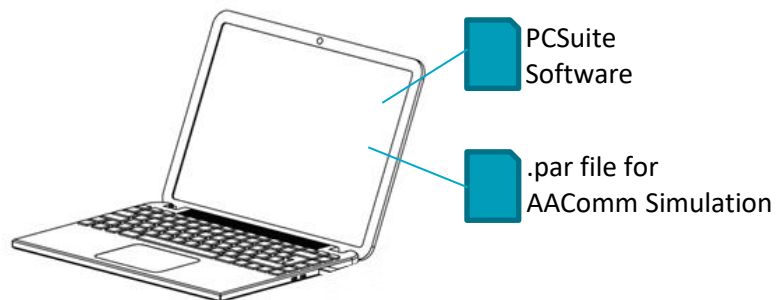


Figure 2. Controller Simulation Setup

The user will need to have Agito PCSuite software installed and also have a .par file that was exported from the controller. Please request for the default .par file there was no opportunity to export this file from the controller.

### 3 Simulation Mode

#### 3.1 Motor Simulation

Motor simulation is a useful tool to test features without having physical motors. It is often used to verify the process automation before including the motors. This reduces the risk of damaging the system, in event that there are bugs in the code. It is also extremely useful for continuing the development of the system even before it is built.

In a normal system, the position feedback (Pos) is read through the encoder and passed back to the control loop to be compared to the commanded position reference (PosRef). In motor simulation, the controller assumes that Pos=PosRef and that the motion is following perfectly. In motor simulation mode, there will not be any current output to the motors, even if they are connected.

Most other features will work as per normal, with exception those involving actual encoder feedback or current output. For example, it will be possible to test CNC Motion to ensure that the segments are downloaded and that the trajectories are as intended. However, it will not be possible to do position event triggering or force control as those will depend on actual feedback and output.



To activate Motor Simulation mode, under the  tab, go the  page. Configure the motor type to 5 – Simulation.

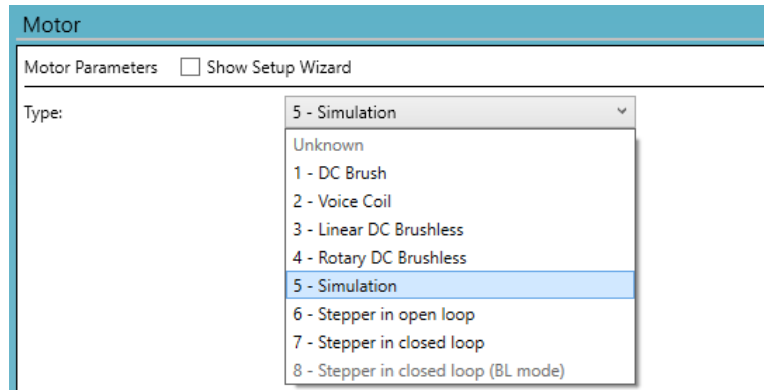


Figure 3. Motor Simulation Setup

### 3.2 Controller Simulation

Controller simulation is useful when the user does not have access to a controller. This mode allows access to the GUI which will usually be greyed out when no controller is connected.

In this mode, features tied to PCSuite can still be used. For example, in simulation mode, the user will be able to configure their Homing sequence and save it to the computer, and send it to another person for use. Likewise, a .acnc sequence can be configured and saved.

Especially used often, is the IDE+ environment. In controller simulation mode, the controller will be able to check against the parameter file for keywords and compile code.

Features that run on the controller, for example, motion profile generation will not be accessible. So, thing like point-to-point motion will not be available even if you set the simulated controller to use simulated motors.

A .par file is required to use PCSuite in controller simulation mode. The following steps explain how to save such a file.

Firstly, connect an actual controller to the computer an establish a connection. Next, navigate to



tab



page.

Ensure that  For AACommServer 'Simulation' is checked. Then upload the parameters file to a locatin in your computer. This will create a virtual image of the controller and parameters as configured at that point of time.

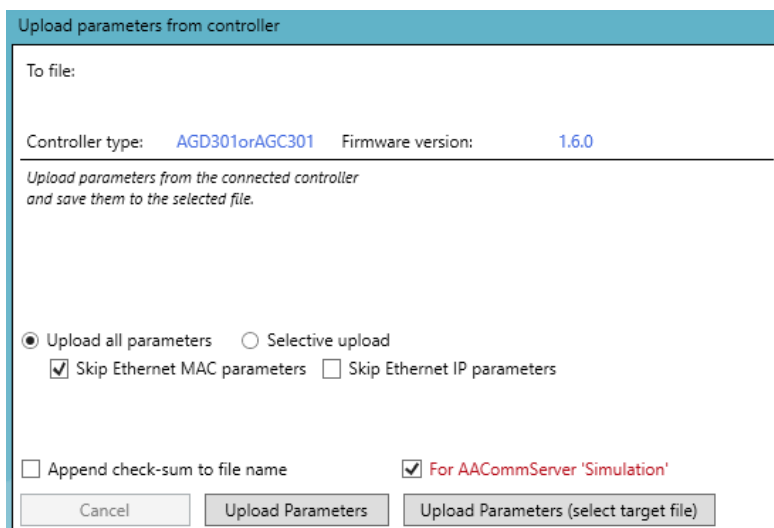


Figure 4. Save .par file for controller simulation

## Controller Simulation

With the .par file, a connection can be established without a physical controller. The following steps explain how to setup a connection in simulation mode.

Firstly, launch PCSuite. This will automatically launch AACommServer in the background. From the bottom right corner, bring up the icon tray, you will see AACommServer running in the background. Double click on the icon to bring out the AACommServer Window.

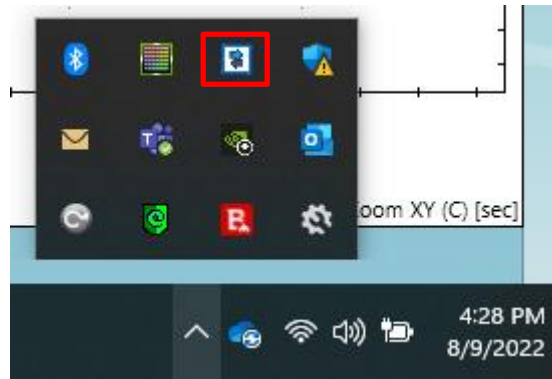


Figure 5. AACommServer Icon Tray

Click on the checkbox  Allow simulation and then browse to the .par file.

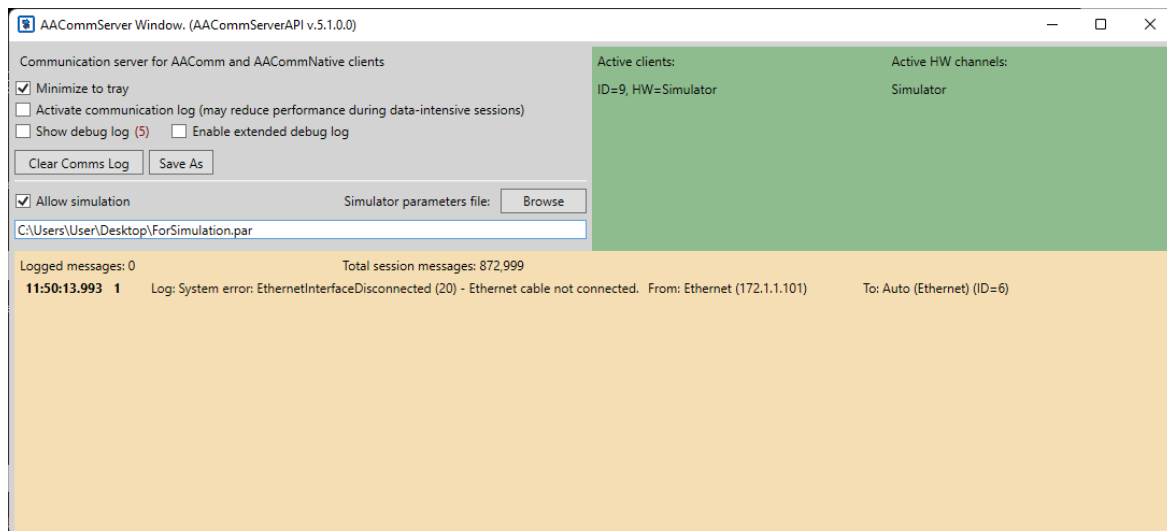


Figure 6. AACommServer Window





Next, in PCSuite, navigate to the **MANAGE** tab and then the **CONN** page. On the left of the page, define the connection name, controller type and communication type. The connection name is up to the user. The controller type has to be the same type as the controller from which the .par file was generated from. The communication type will be **Simulator**. Once configured, click on **Add**.

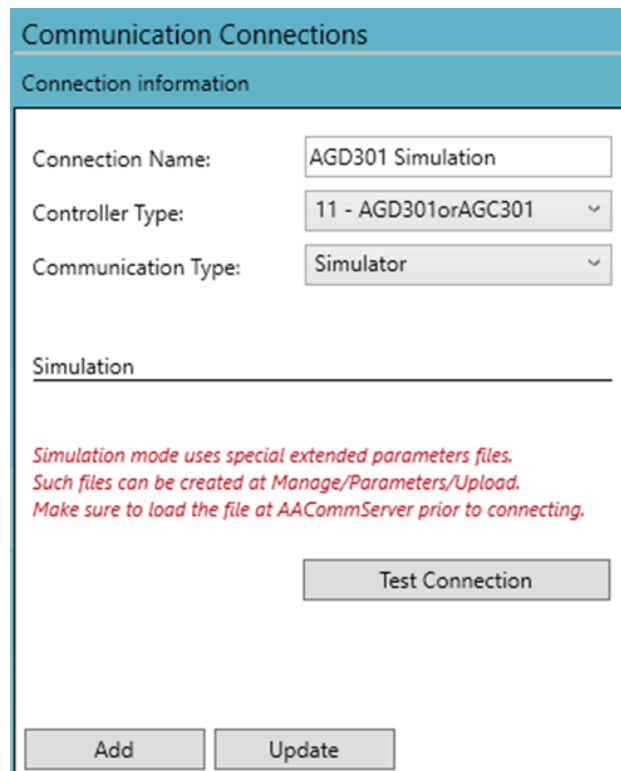


Figure 7. Connection Window – Add Simulator Connection

Once done, you can connect to a simulator controller to use PCSuite.

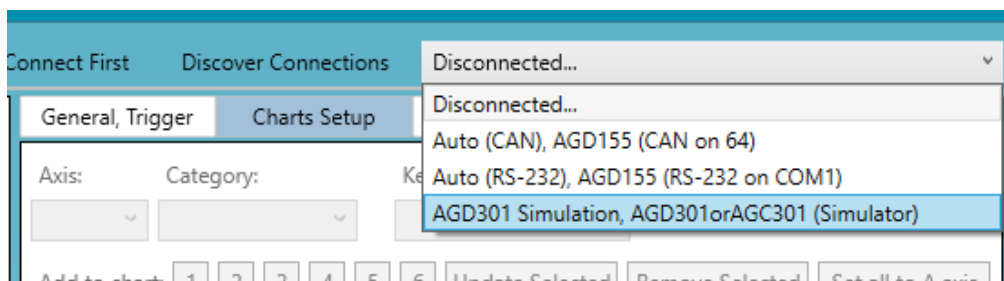


Figure 8. Connection – Connect to Simulator

