# Motor Acceleration Analysis

The purpose of this tutorial is to introduce the Motor Acceleration module of ETAP. It will show the static and dynamic models that can be used to simulate real motor characteristics. The minimum amount of data necessary to run each type of study will be entered. You will need to contact OTI with your Return Key Code so that you can activate this module. For this section of the tutorial you should select "Example Project (ANSI)" option when starting ETAP Demo.

Running a Static Motor Starting Study

🖱 Switch to Motor Acceleration Analysis mode by clicking on the Motor Acceleration Analysis button on the Mode toolbar.
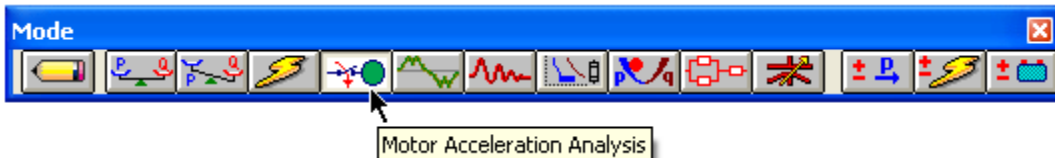
🖱 From the Study Case toolbar, open the Motor Starting Study Case editor. From here you can add and modify conditions for your study.
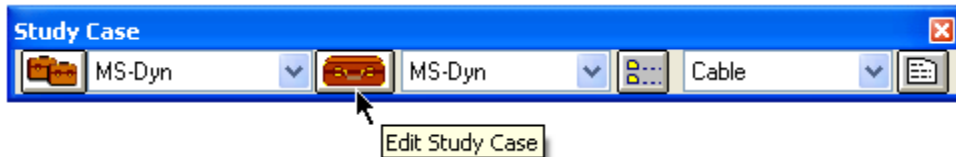

🖱 On the Event page, change the Total Simulation Time to 10 seconds. The output plots will now graph the results of the study from time 0 to 10 seconds.
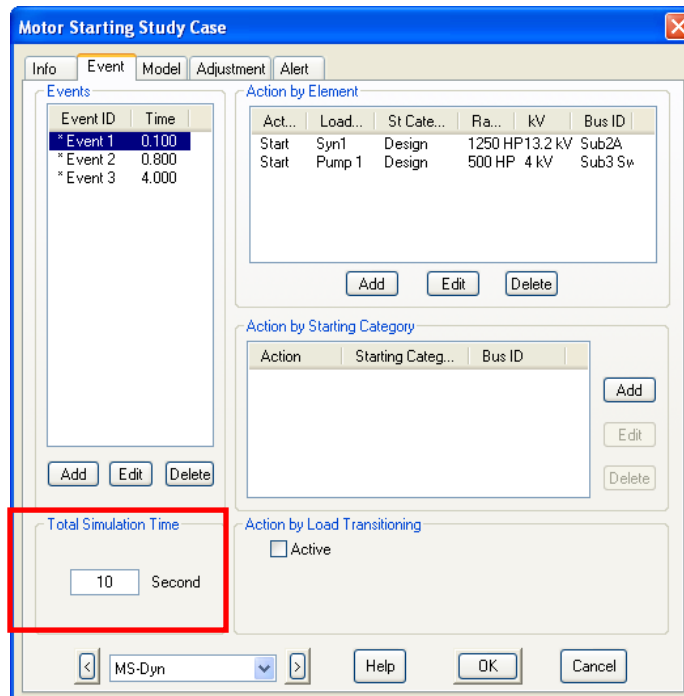
🖰 Now you can add an unlimited number of events to simulate switching actions in a single Motor Starting simulation. You can start or switch off individual loads or categorized motor groups with the Action by Load and Action by Starting Category features, respectively. You can also change the operating load by clicking the Load Transitioning option to change from one loading category to another.

🖰 You can add an event by selecting the Event page and clicking on the Add button under the Events heading. Actions occurring at each event time can be added, modified, or deleted by selecting the event and modifying the respective Action heading (by Element, by Starting Category, by Load Transitioning). Click OK the save the changes you made in the study case editor.

🖰 Open Syn1's editor by double-clicking on the element graphic in the OLV, and go to the Load Model page. In the Acceleration Time (Static Starting) fields, enter 1 second as the no load acceleration time, and 3 seconds as the full load acceleration time. Click OK to save and exit.
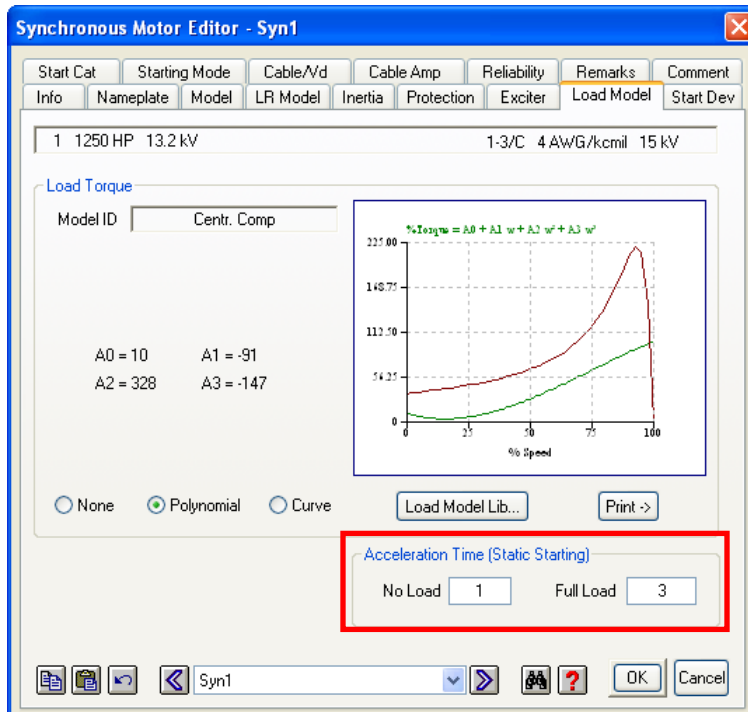

🖰 The data you have just seen and changed is the minimum necessary to run a simple Static Motor Starting study. Run the study by clicking on the Run Static Motor Starting button on the Motor Starting toolbar.

Note: Once the calculation has completed, plots and output reports are accessible.
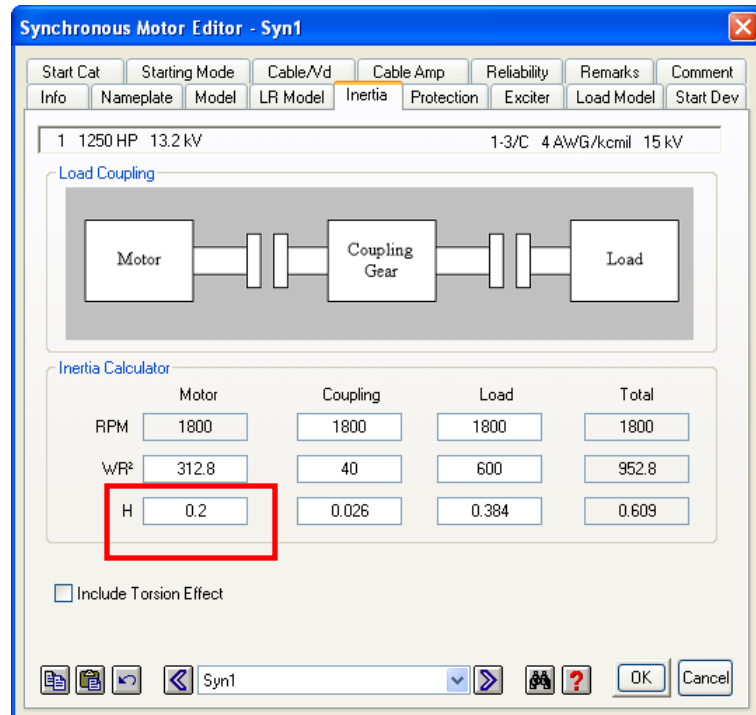
Running a Dynamic Motor Starting Study

🖰 Now a Dynamic Motor Starting study will be performed using the same Study Case conditions and events as the Static study. However, additional data is necessary for a Dynamic Study. Double-click the Syn1 element graphic to open its editor, and go to the Model page. Under the Dynamic Model heading, a category other than "None" must be selected. Clicking on the Typical Data button will fill the necessary fields based on the ratings specified under the Nameplate page.
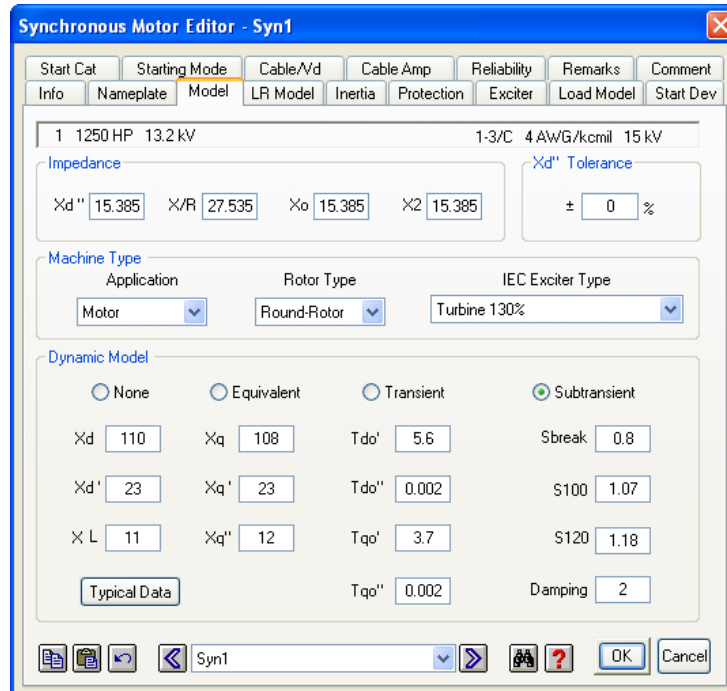
🖰 Now go to the Load Model page to view the load model. Ensure that a Load Model is entered for this motor. If a Load Model needs to be entered, click the Load Model Lib button, and accept a Motor Load by clicking OK in the window that appears.
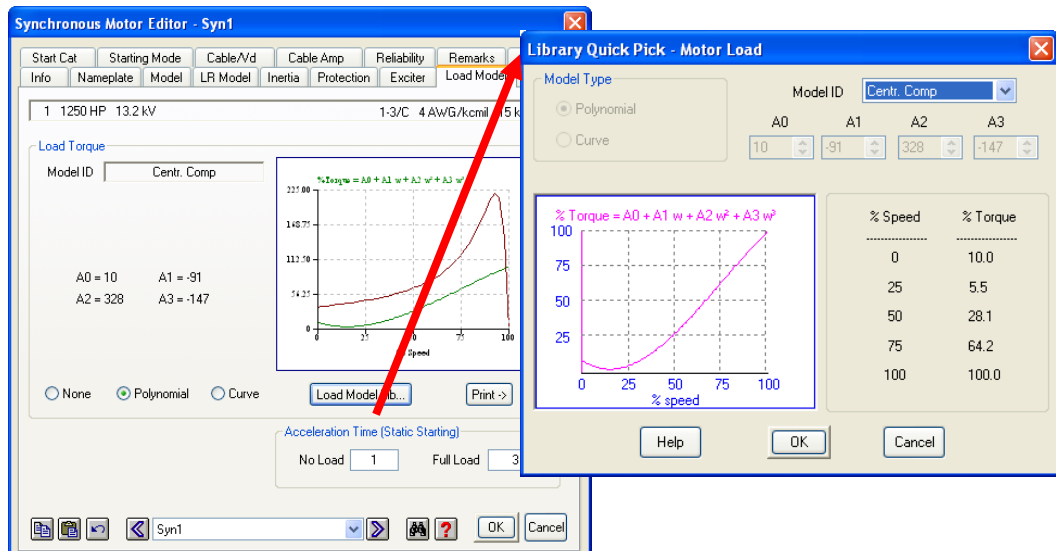
🖰   Also, go to the Inertia page and enter 0.2 into the motor inertia (H) field, and click OK. The motor WR^2 will automatically be updated. Exit the Syn1 Synchronous Motor editor by clicking OK.

🖰   Now you can run a Dynamic Motor Starting study. Click the Run Dynamic Motor Starting button on the Motor Starting toolbar to perform the study.

🖰   To view the plots that are generated as a result of a study, click the Motor Starting Plots button on the Motor Starting toolbar. The Motor Starting Plot Selection window will appear to allow you to choose which plots will be displayed. Select the plots you wish to view, or click OK to show all plots.
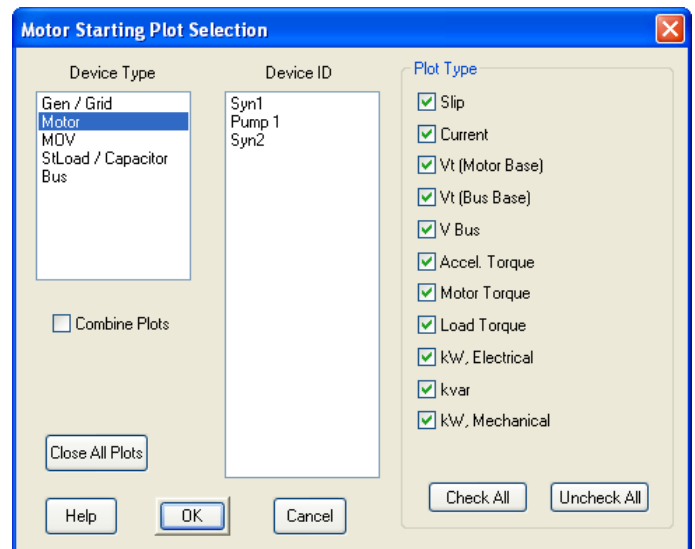
🖰   The Motor Acceleration Analysis module of ETAP is an excellent tool to simulate and investigate motor acceleration scenarios.