ACIM Section (Archived)

> The ACIM machine model and its associated **Hardware Configurations** have been archived. If starting a new project, consider using the **SCIM Machine Model** instead.

The AC Induction Machine model implements a three-phase induction machine (asynchronous machine) with a resolver, encoder, and hall effect sensor.

ACIM Configuration Page

In the **System Explorer** window configuration tree, expand the **Power Electronics Add-On** custom device and select **Circuit Model >> ACIM** to display this page. Use this page to configure the ACIM machine model. Additional information about the model can be found in the National Instruments Help page for the **ACIM Constant Parameter Model VI**.

This page includes the following components:

Name	Specifies the name of the machine model.
Description	Specifies a description for the machine model.

Motor Configuration

	Symbol	Units	Default	Description
Magnetizing Inductance	L_m	Henries	0.0462	Specifies the magnetizing inductance of the motor.
Stator Leakage Inductance	L_{ls}	Henries	0.00194	Stator winding leakage inductance. This value must be greater than 0.
Rotor Leakage Inductance	L_{lr}	Henries	0.00245	Rotor winding leakage inductance. This value must be greater than 0.
Stator Resistance	R_s	Ohms	0.896	Stator winding resistance. This value must be greater than 0.
Rotor Resistance	R_r	Ohms	1.82	Rotor winding resistance. This value must be greater than 0.
Loop Time	T_s	Seconds	9E-7	Describes the timestep of the machine model.
Pole Pairs	PP		2	Number of machine pole pairs.

	Symbol	Units	Default	Description
Inertia		kgm^2	0.000225	Moment of inertia of the electric motor. This value must be equal to or greater than 0.
Friction Coefficient			0	Friction coefficient of the electric motor. This value must be equal to or greater than 0.

	Symbol	Units	Default	Description
Base Temperature	T_{base}	Kelvin	298.15	Base temperature for the stator resistance and the rotor resistance. This value must be greater than 0.
Stator Temperature Coefficient	k_s	1/Kelvin	0.00393	Coefficient for temperature correction of the stator resistance. This value must be greater than 0.
Rotor Temperature Coefficient	k_r	1/Kelvin	0.00393	Coefficient for temperature correction of the rotor resistance. This value must be greater than 0.

Use the Input Mapping Configuration to route signals to the **Voltage Phase A**, **Voltage Phase B**, and **Voltage Phase C** inputs of the machine model. Available routing options may vary depending on the selected **Hardware Configuration**.

Group	Specifies the group that will be routed to the input voltages of the machine. The available routing options are defined by the selected Hardware Configuration, however it is typical to see the following options by default: • **Measurements** - eHS circuit model measurements
Element	Specifies the index of the measurement in the group that has been selected as the input voltage of the machine.

ACIM Section Channels

This section includes the following custom device channels:

Channel Name	Type	Units	Default Value	Description
Enable	Input		0	Set this channel to one of the following values: • **0** - Disables the machine model. • **1** - Enables the machine model.
Load Torque	Input	Newton Meters	0Nm	Torque applied to the shaft of the machine.
Rotor Temperature	Input	Kelvin	298.15K	Temperature of the motor rotor. If this value is greater than 0, **Temperature Correction** is performed for the **Stator Resistance** and the **Rotor Resistance**.
Stator Temperature	Input	Kelvin	298.15K	Temperature of the motor stator. If this value is greater than 0, **Temperature Correction** is performed for the **Stator Resistance** and the **Rotor Resistance**.
Va	Output	Volts	0V	Phase A voltage of the electric motor.
Vb	Output	Volts	0V	Phase B voltage of the electric motor.
Vc	Output	Volts	0V	Phase C voltage of the electric motor.
Ia	Output	Amperes	0A	Phase A current of the electric motor.
Ib	Output	Amperes	0A	Phase B current of the electric motor.
Ic	Output	Amperes	0A	Phase C current of the electric motor.
Electromagnetic Torque	Output	Newton Meters	0Nm	Electromagnetic torque of the electric motor.
Speed	Output	RPM	0RPM	Rotor speed of the electric motor.
Position	Output	Radians	0rad	Rotor position of the electric motor.

ACIM Model Description

For a full description of the ACIM model and its parameters, please see the National Instruments Help pages at the links below:

- Constant Parameter Model for ACIM Simulation
- ACIM Constant Parameter Model VI
- Temperature Correction
- Motor Speed and Rotor Position VI (Mechanical Model)