



# Induction Machine

## DFIG – DFIM – Squirrel Cage Induction Machine

Induction motors are widely used as industrial drives because they are self-starting, reliable and economical. They're also increasingly used with variable-frequency drives (VFDs) in variable-speed service, as well as in wind turbines, for example. OPAL-RT's solutions support various machine configurations and machine parameters that can be modified at runtime, enabling flexible test possibilities, and making our simulation tools indispensable for induction machine control testing.

**Table: FPGA-Based Induction Machine model overall specifications\***

	Induction Machine (IM)
<b>Machine topology</b>	DFIG, DFIM with 3 phase wye connection on stator and rotor side
<b>Maximum machine speed</b>	400 kRPM @ 1 pair pole
<b>Maximum current / voltage / power /torque</b>	Not limited
<b>Minimum Time Step</b>	375 ns
<b>Calculation precision</b>	Single Floating Point
<b>Compatibility with JMAG, Ansys and Motorsolve</b>	No
<b>Electrical model parameters</b>	Rotor and stator inductances (referred to the stator), rotor and stator resistances, number of pair poles
<b>Mechanical model</b>	Inertia and friction mechanical model provides on CPU. User can define their own advanced model on CPU or FPGA.
<b>Simulation of cogging torque / current harmonics</b>	No
<b>Simulation of saturation vs current amplitude</b>	No
<b>Simulation of flux vs speed or temperature</b>	No
<b>Simulation of copper losses</b>	No
<b>Audience / Application</b>	Engineers with access to the basic machine parameters. For tests that don't require higher fidelity regarding the current and torque harmonics.
<b>Recommended platform</b>	OP560x, OP4510, OP5700

\*The table describes the main specifications of the FPGA-Based Induction Machine model available on eFPGASIM. This model is typically used for an application requiring very fast simulation and accurate results. OPAL-RT also offers CPU-based models for slower application and consultancy services to develop specific machine models.