DIN50A - ±50 A DIN rail-mountable current sensor

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The DIN50A block is a simulation model included in the Imperix Power library. It implements the model of the imperix ±50 A DIN rail-mountable current sensor in Simulink and PLECS simulation.

For more information regarding the Imperix Power library, please read Getting started with Imperix Power library.

Imperix Power library is available starting from ACG SDK 2024.2. Simulink Simscape Electrical or PLECS is also required. The Simulink version is only compatible with Specialized Power Systems. The supported versions are:
• Simulink R2016a or newer.
• Plexim PLECS 4.5 or newer.

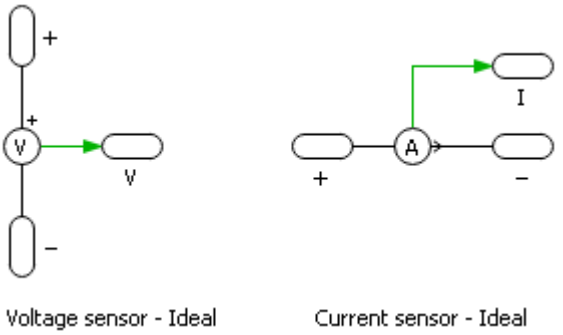
Modeling of DIN50A

The DIN50A model has two modeling levels:

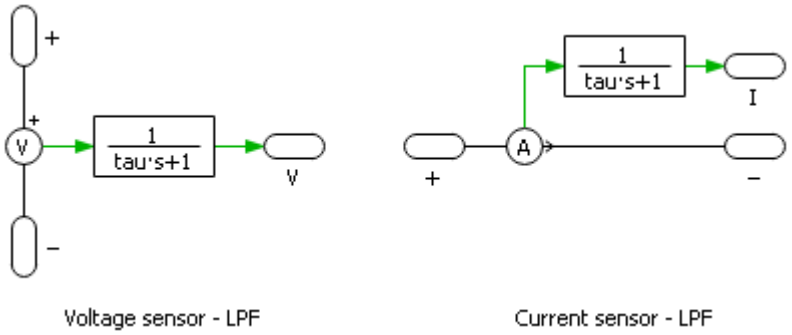
- **(A) Simple**

- **(B) Detailed**

A generic sensor can be approximately modeled by an ideal sensor in series with an optional first-order Low-Pass Filter (LPF). The relationship between sensor's bandwidth f_{BW} and the time constant τ of the LPF follows $\tau = \frac{1}{2\pi f_{BW}}$.



Ideal model



1st-order LPF model

A sensor is modeled as a first-order LPF only if its bandwidth lies within the frequency range of a given modeling level. Otherwise, it is modeled as an ideal sensor. The following table summarizes the information on the DIN50A voltage sensor.

Sensor	Bandwidth [kHz]	(A) Simple	(B) Detailed
DIN50A	200	Ideal	Ideal

Modeling of the DIN50A sensor

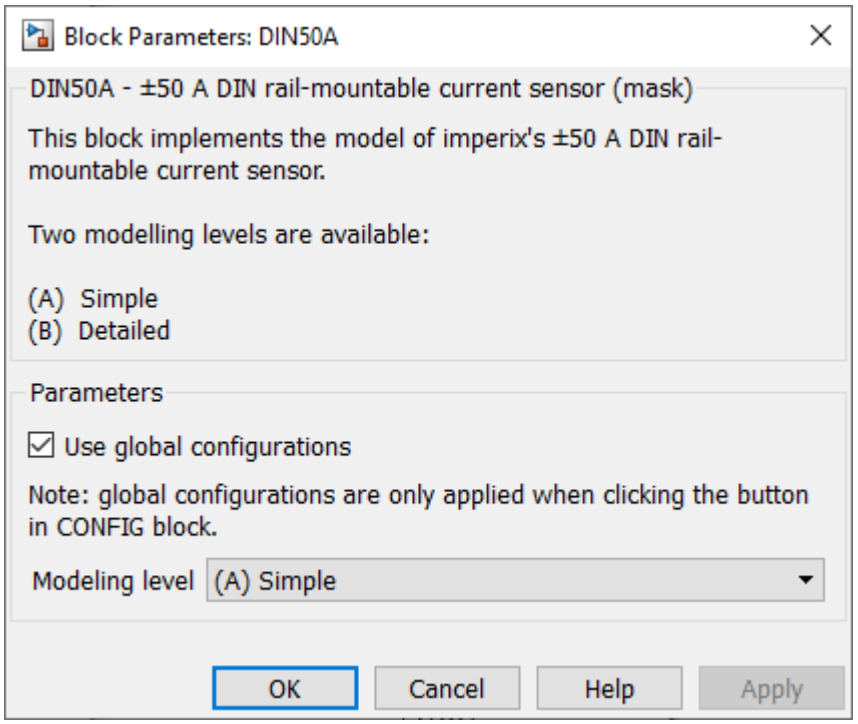
Simulink DIN50A block

Port specification

- The output `i` is the measured current through the two electrical ports.

Parameters

- `Use global configurations` is ticked when the block receives global configurations from the `Config` block.
- `Modeling level` selects the modeling level of the current sensor.



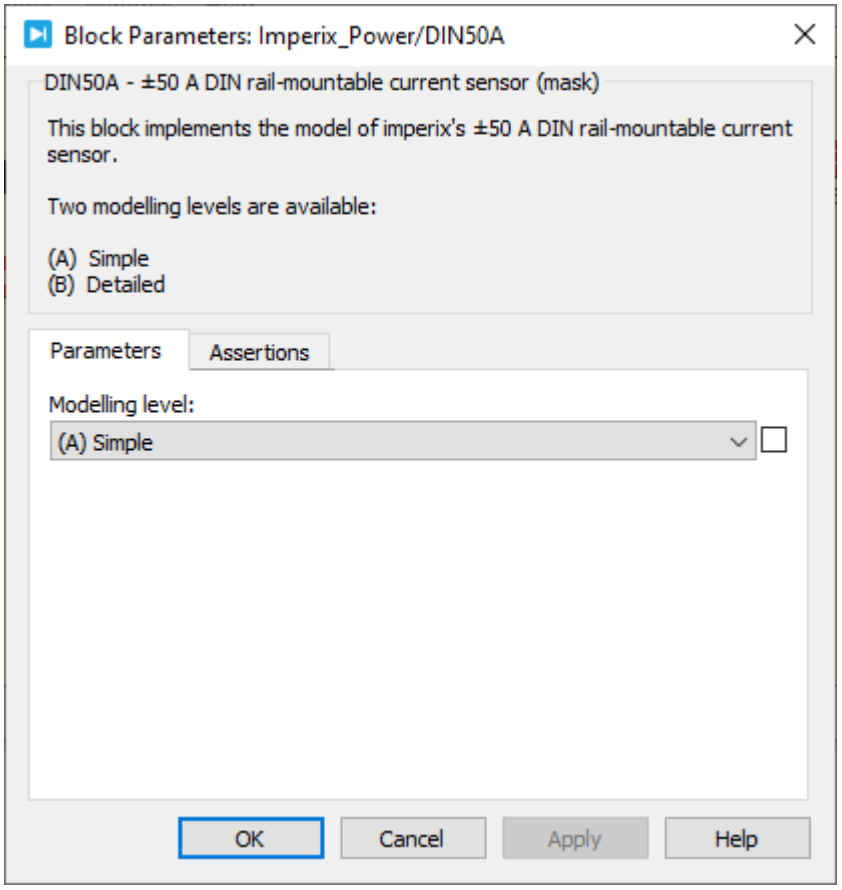
PLECS DIN50A block

Port specification

- The output `i` is the measured current through the two electrical ports.

Parameters

- `Modeling level` selects the modeling level of the current sensor.



Probe signals

The following signals can be monitored by a Probe block in PLECS.

- `True value [A]` monitors the true value of the measured current through the two electrical ports in Volt.
- `Sensor output [V]` monitors the physical output of the current sensor in Volt.