

GCP – Grid connection panel

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The GCP block is a simulation model included in the [Imperix Power library](#). It models the imperix [grid connection panel](#) in Simulink and PLECS simulation.

For more information regarding the Imperix Power library, please read [Getting started with Imperix Power library](#).

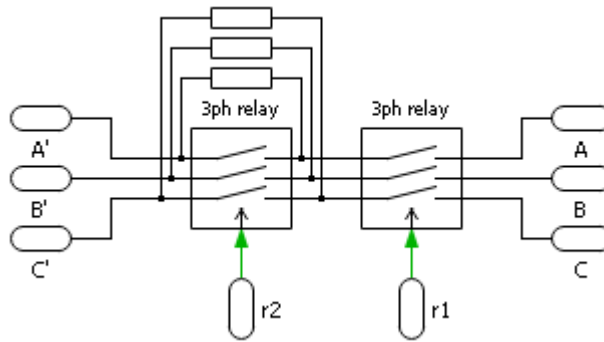
Imperix Power library is available starting from ACG SDK 2024.2. Simulink Simscape Electrical or PLECS is also required. The Simulink version is only compatible with Specialized Power Systems. The supported versions are:

- Simulink R2016a or newer.
- Plexim PLECS 4.5 or newer.

Modeling of GCP

The schematic of the GCP model is depicted on the right. It has one modeling level:

- **(A) Simple**



Schematic of GCP model

For more detailed model parameters and measurement results, please contact [\[email protected\]](#).

The GCP model has two variants: AC 230V and AC 110V, suitable for different grid standards. In the simulation model, the only difference is the value of the precharge resistors.

- AC 230V: $R = 47\Omega$
- AC 110V: $R = 22\Omega$

The model has two 3-phase relays controlled by two signal inputs r1 and r2. In most systems prewired by imperix, the relays are controlled by [B-Box RCP](#) using the [GPO](#) ports below:

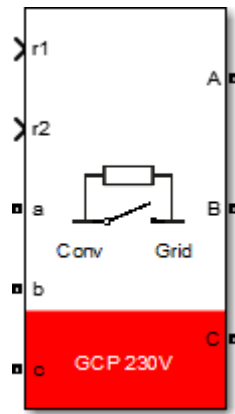
Relay name	Input signal name	GPO port
Precharge relays	r1	0
Bypass relays	r2	1

The relays have an on-resistance of 5 m Ω modeling the non-idealities of the relays.

Simulink GCP block

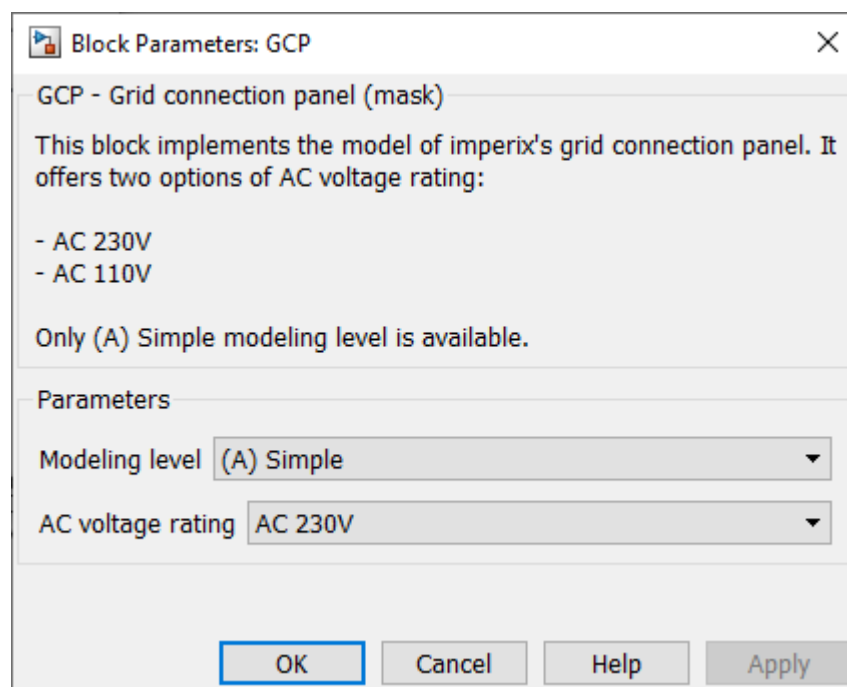
Port specification

- The inputs r1 and r2 control the precharge relay and bypass relay separately. The relays are closed when the input is different from 0.
- The connection ports a, b, c are the electrical ports connected to the three-phase converter.
- The connection ports A, B, C are the electrical ports connected to the three-phase grid.



Parameters

- Modeling level selects the modeling level (here, only "(A) Simple" is available).
- AC voltage rating selects the AC voltage rating (determines the value of the precharge resistors).

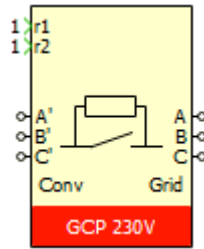


PLECS GCP block

Port specification

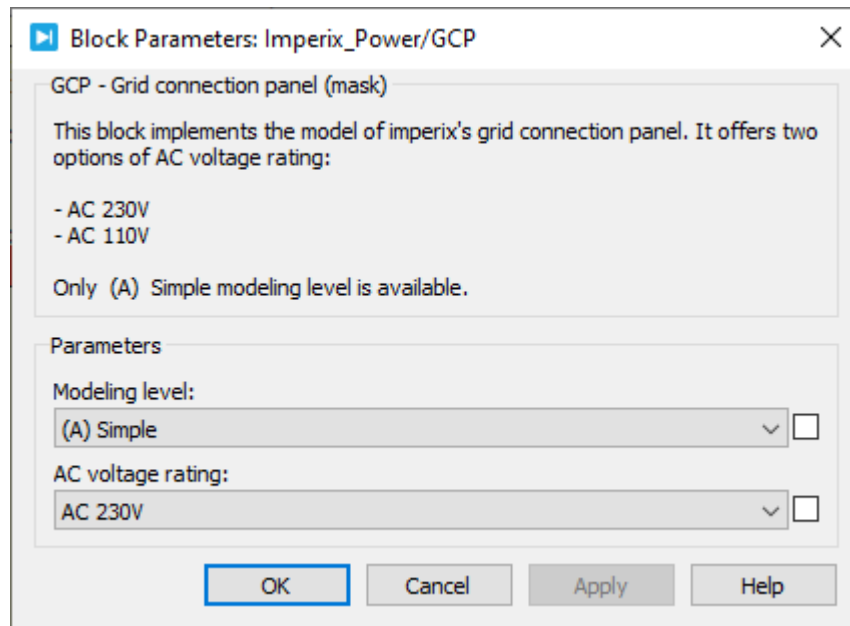
- The inputs r1 and r2 control the precharge relay and bypass relay separately. The relays are closed when the input is different from 0.
- The connection ports A', B', C' are the electrical ports connected to the three-phase converter.

- The connection ports A, B, C are the electrical ports connected to the three-phase grid.



Parameters

- Modeling level selects the modeling level (here, only "(A) Simple" is available).
- AC voltage rating selects the AC voltage rating (determines the value of the precharge resistors).



Probe signals

This block has no signals to be monitored.