

p11_3p_1.gce

Attributes

```
mainvars: u v w s c omega
rparms: kp=1.0 ki=1.0
```

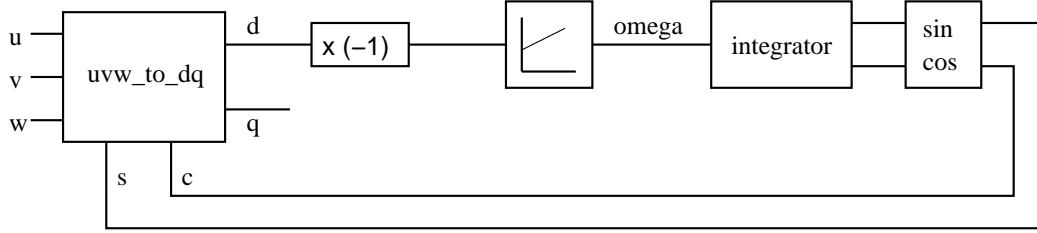


Figure 1: Implementation of p11_3p_1.gce

Description

p11_3p_1.gce is a phase-locked loop implemented as shown in the figure. The real parameters kp and ki are used for the PI controller. The equations that relate the variables are as follows.

$$\begin{aligned}\alpha &= u, \\ \beta &= \frac{1}{\sqrt{3}}(w - v), \\ q &= c\alpha - s\beta, \\ d &= s\alpha + c\beta.\end{aligned}$$

The parameters kp and ki need to be set carefully. As an example, for a frequency of 50 Hz, $kp = 500$, $ki = 10$ work well if the amplitude of the input signals is 1. If the amplitude is different, kp and ki should be scaled appropriately. For example, for an amplitude of 100, $kp = 5$, $ki = 0.1$ would be appropriate.

AC behaviour is not implemented.