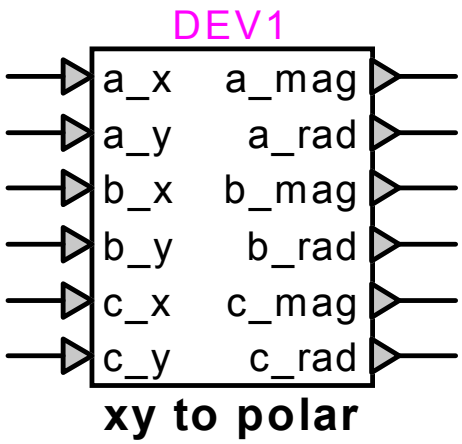
Phasor operation : 3-phase (x,y) to polar



1 Description

This device converts an (x,y) representation of 3 vectors or phasors to their polar (magnitude,angle) equivalent.

1.1 Pins

This device has twelve pins:

pin	*type*	*description*	*units*
a_x	input pin	phase-a x-coordinate	any
a_y	input pin	phase-a y-coordinate	same as a_x
b_x	input pin	phase-b x-coordinate	any
b_y	input pin	phase-b y-coordinate	same as b_x
c_x	input pin	phase-c x-coordinate	any
c_y	input pin	phase-c y-coordinate	same as c_x
a_mag	output pin	phase-a magnitude	same as a_x
a_rad	output pin	phase-a angle	rad
b_mag	output pin	phase-b magnitude	same as b_x
b_rad	output pin	phase-b angle	rad
c_mag	output pin	phase-c magnitude	same as c_x
c_rad	output pin	phase-c angle	rad

1.2 Parameters

No parameters are required for this device.

1.3 Input

The input pins may be connected to any control signals.

The (x,y) coordinates are the *x*-axis and *y*-axis projections of a vector or phasor on a reference frame.

1.4 Output

The output is the polar representation of a vector or phasor in a reference frame. The polar coordinates are the magnitude and angle corresponding to the (x,y) coordinates used as input.

The conversion from (x,y) to polar is immediate, and is calculated as follows:

$$\begin{aligned} \text{magnitude} &= \sqrt{x^2 + y^2} \\ \text{angle} &= \tan^{-1}\left(\frac{y}{x}\right) \end{aligned} \qquad (1)$$

The phasor magnitude is the peak amplitude, not the RMS value. The phasor angle is expressed in radians.