

Polar Graph Examples

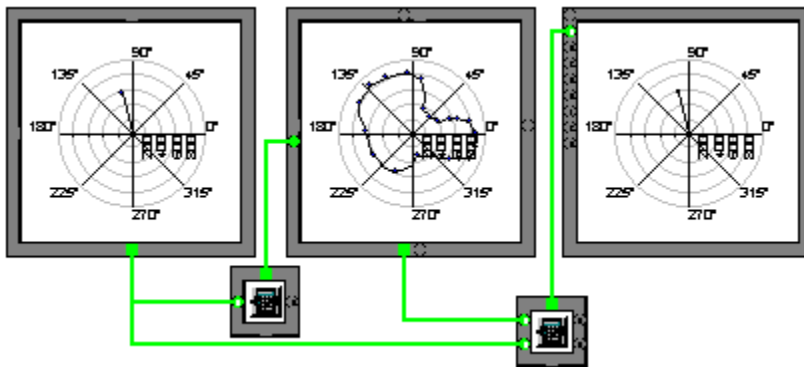
FILE: Polar2.cln

Introduction

This file illustrates the 3 types of Polar Graph Object available within CleanSheet. It is a rather artificial demonstration, but helps you to understand the difference between an Input, Output and Calculation Graph. It also demonstrates the Calculator Object.

This sheet consists of 3 main objects, the input Polar graph inputs a vector, the middle object - the Polar Calculation Graph represents a restricted space which the vector must be confined to. The final object is a Polar Output Graph, this displays the confined vector result.

Switch the sheet into Automatic recalculation mode, and Use mode. In order to view the whole sheet at once, set the Scale (on the Settings menu) to Scale to Fit. Then move the point on the Input Polar Graph. Notice that if the point is inside the area marked out in the Polar Calculation object then it is plotted on the output object, if it is outside, then its radius is reduced to bring it inside the area.



Click on any part you need further help with.

This is the Polar Graph Input object - it inputs a vector of the form {radius, theta} into the sheet, where Radius is the distance from the centre and theta is the angle subtended by a line drawn to the centre.

This is a Polar Calculation Object - it has a curve which represents a function drawn onto it, in this case the curve represents a boundary. The angle fed into this object is converted to the maximum radius permissible at that angle.

This is a Polar Output Graph, an array is fed into this representing a data point. The array must be of the form $\{\{\theta\},\{r\}\}$, notice that the order of the two is reversed from the Polar Input Graph. This is done because several series may be plotted in one array $\{\{\theta\},\{r_1\},\{r_2\}\dots\}$ and hence θ must be the first in the list. Notice also that this object requires columns of input, hence $\{\theta,r\}$ will not suffice, it must be $\{\{\theta\},\{r\}\}$ with the 2 sets of curly brackets.

This is a Calculator Object. It is used here to simply extract the angle theta from the {radius, Theta} array coming from the Polar Input Graph.

The equation that does this is simply $A[1]$ which takes element 1 from input A and returns it as a result (remember CleanSheet arrays start at 0).

This is a Calculator Object. It takes the angle from the {radius, theta} array that comes into input B, and merges it with the minimum radius between input B and input A. It builds the result into an array suitable for the Polar output graph to plot.

The equation is: **{{b[1]},{ min{a,b[0]} }}**

b[1] is the angle direct from the Input Graph.

min{a,b[0]} compares the radius from the input with the maximum radius for that angle and returns the minimum.

The remaining brackets are to make an array **{{angle},{radius}}** required by the Polar Output Graph.

