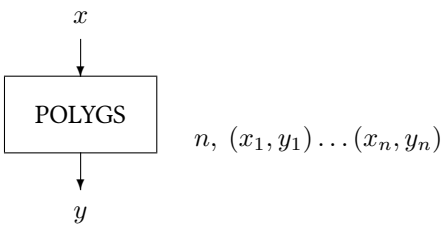
## Block POLYGS

The POLYGS block simulates a step function defined through the parameters.






| | |
|---|---|
| **Name** | POLYGS |
| **Function** | fb0019 |
| **Inputs** | 1 |
| **Outputs** | 1 |
| **Parameters** | 3 . . . [7001] |
| **Strings** | 0 |
| **Group** | S |

### Inputs

| | |
|---|---|
| 1 | Any signal $x$ |

### Outputs

| | |
|---|---|
| 1 | Interpolated value $y(x)$ |

### Parameters

| | |
|---|---|
| 1 | Number of given points, $2 \leq n \leq 3500$ |
| 2 | $x$-coordinate of $1^{\text{st}}$ point, $x_1$ |
| 3 | $y$-coordinate of $1^{\text{st}}$ point, $y_1$ |
| 4 | $x$-coordinate of $2^{\text{nd}}$ point, $x_2$ |
| 5 | $y$-coordinate of $2^{\text{nd}}$ point, $y_2$ |
| . . . | |
| $2n$ | $x$-coordinate of $n^{\text{th}}$ point, $x_n$ |
| $2n+1$ | $y$-coordinate of $n^{\text{th}}$ point, $y_n$ |

### Strings

None

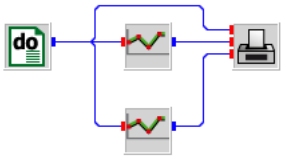
Description

The $x$-coordinates $x_1 \ldots x_n$ must either be stricty increasing, i. e., $x_1 < x_2 \ldots < x_n$ or strictly decreasing, $x_1 > x_2 \ldots > x_n$. The output signal $y$ is calculated from the input $x$ according to

$$y = \begin{cases} y_1 & \text{if } x < x_1 \\ y_i + (x - x_i)(y_{i+1} - y_i)/(x_{i+1} - x_i) & \text{if } x_i \le x < x_{i+1} \\ y_n & \text{if } x_n < x \end{cases}$$

for the case of increasing $x$ values and correspondingy for decreasing $x$ values.

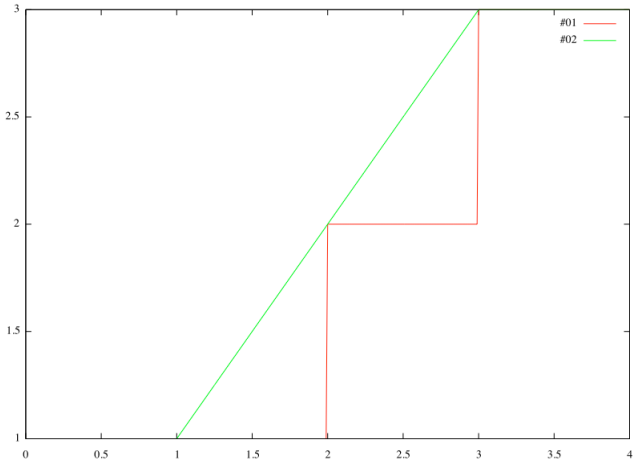
polygs.vseit



A DO block delivers values from 0 to 10 in steps of 0.1. The POLYG block interpolates as specified by the block parameters

```
4
1 2.5
3 1.7
5 1.5
9 2
```

The PLOT block displays the graph.




Please observe how the POLYG block keeps the output constant for data out of the specified parameter range.