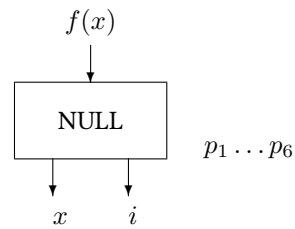


Block NULL

The NULL block searches a root of a continuous function.



Name	NULL
Function	fb0054
Inputs	1
Outputs	2
Parameters	6
Strings	0
Group	L

Inputs

- 1 Signal $y = f(x)$, which corresponds to the output x

Outputs

- 1 Signal x which is varied iteratively until $y = 0 \pm \Delta y_{\max}$. This output has to be connected to a corresponding TOL block.
- 2 Indicator i for iteration failure
 - 0 Solution found
 - 1 Too many iterations
 - 2 Both function values positive at boundaries
 - 3 Both function values negative at boundaries
 - 4 Found trivial solution

Parameters

- 1 Mode
 - 0 Involution algorithm (in the current version this is the only option)
- 2 Lower limit $x_{\min}$ of the iteration interval
- 3 Upper limit $x_{\max}$ of the iteration intervall
- 4 Tolerance $\Delta y_{\max}$ for the accuracy of the calculated root
- 5 Maximum number $N_{\max}$ of iterations

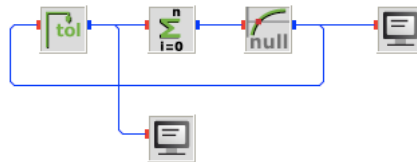
- 6 Output value for x which is returned when the number $N_{\max}$ of iterations is reached or no solution was found within the iteration interval

Strings

None

Description The block determines the root of a function by different algorithms which can be set via the block's first parameter. The output x is changed iteratively until y is equal to $0 \pm \Delta y_{\max}$.

null.vseit



A **POLYN** block provides the function $y = x^2 - 1$. The **NULL** block in combination with the **TOL** block finds the root of the function by the involution algorithm in the interval $[0, 5]$. The **SCREEN** block, which is connected directly with the output off the **TOL** block displays all iteration steps. The **SCREEN** block which is connected to the **NULL** block displays the solution only.

```
0.0000000000
5.0000000000
2.5000000000
1.2500000000
0.6250000000
0.9375000000
1.0937500000
1.0156250000
0.9765625000
0.9960937500
Solution x = 0.9960937500
```

Remarks The iteration intervall may contain only a single root.