

## PID Learning and Testing Program

This program enables you to run a PID controller function block in the easy simulation tool in order to understand and learn about the closed-loop

control processes. The program contains three screens:



*Start screen*

Entry screen with company name and time

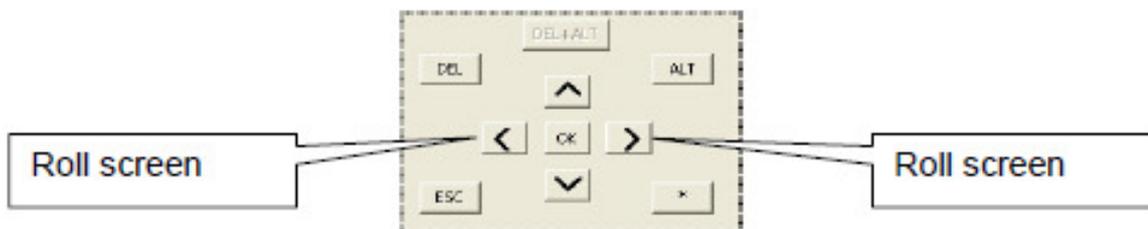
*Value display screen*

Shows an overview of all values

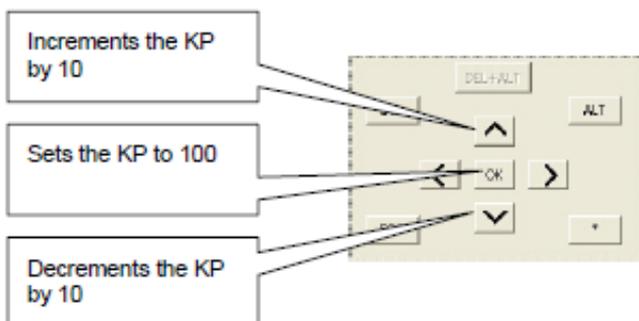
*Parameters screen*

Is used for entering the proportional gain

Use the Cursor left . right buttons to access the screens:



Enter the **proprtional gain KP** in the Parameters screen. This value is required for the controller to function.



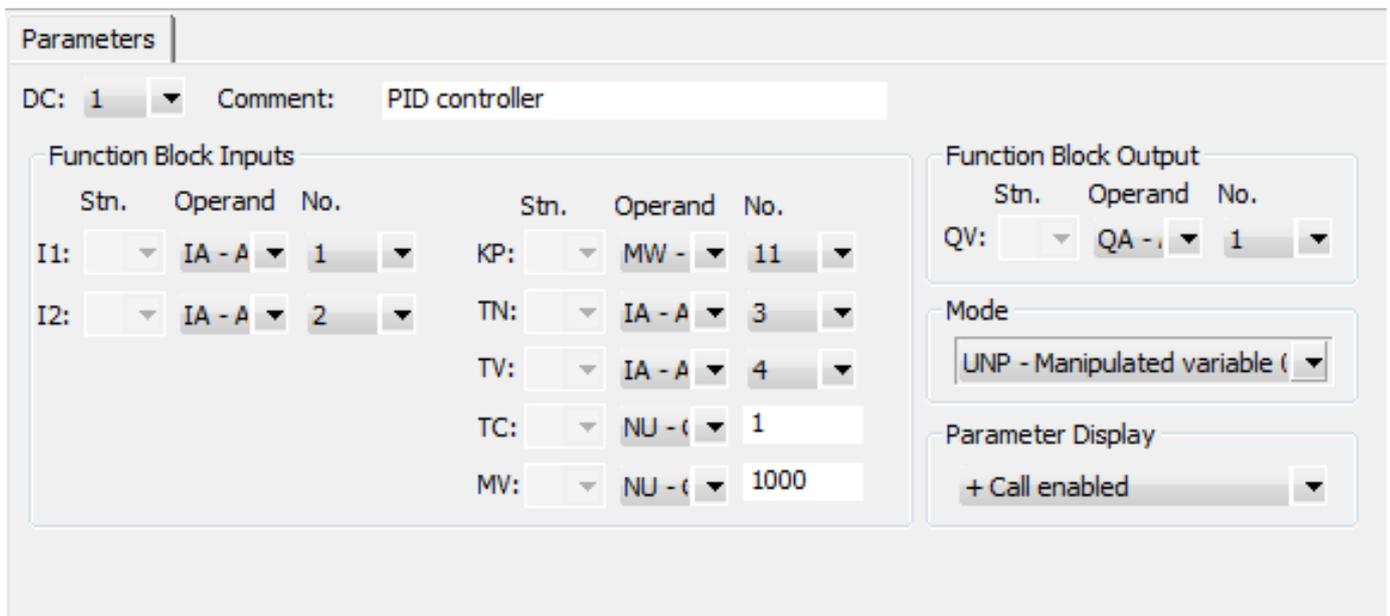
## Wiring

### Inputs

I01 Enable  
 I02 P component active  
 I03 I component active  
 I04 D component active  
 I05 Manual manipulated value  
 IA1 Setpoint  
 IA2 Actual value  
 IA3 Reset time EN  
 IA4 Rate time TV

### Parameters

The other required values, **TC** and **MV**, are entered as fixed values in the Parameters tab. The following parameters are entered:



Parameters

DC: 1 Comment: PID controller

Function Block Inputs			Function Block Output		
Stn.	Operand	No.	Stn.	Operand	No.
I1:	IA - A	1	KP:	MW -	11
I2:	IA - A	2	TN:	IA - A	3
			TV:	IA - A	4
			TC:	NU - c	1
			MV:	NU - c	1000

Function Block Output

QV: QA - 1

Mode: UNP - Manipulated variable (

Parameter Display: + Call enabled

The following tests require the KP value in screen 3 to be set to 100. 100 means that the proportional gain is 1 : 1.

### Activating P controller

Switch on inputs 1 and 2

Increase the actual value IA1 on the slide adjuster

Adjust the setpoint IA 2

Result: The manipulated variable is always the difference between the setpoint and the actual value.

### PI controller

Add input 3 to the P control system

Move up the slide adjuster IA3 a little so that there is a reset time

Result: If the actual value does not react, the manipulated variable is increased

### PID controller

Add input 4 to the PI control system

Slightly increase the slide adjuster for IA4

Result: The differential component is active