Control_PID
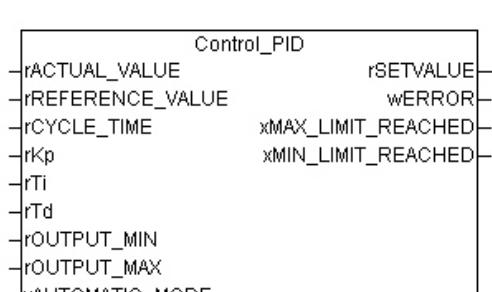
<table>
<tr><td colspan="3" align="center">**WAGO-I/O-*PRO* 32 Library elements**</td></tr>
<tr><td>**Category:**</td><td colspan="2">Building automation</td></tr>
<tr><td>**Name:**</td><td colspan="2">Control_PID</td></tr>
<tr><td>**Type:**</td><td>Function ☐</td><td>Function block **X** | Program ☐</td></tr>
<tr><td>**Library name:**</td><td colspan="2">Control.lib</td></tr>
<tr><td>**Applicable to:**</td><td colspan="2">All programmable fieldbus controllers</td></tr>
</table>

Input parameter:	Data type:	Comment:
rACTUAL_VALUE	REAL	
rREFERENCE_VALUE	REAL	
rCYCLE_TIME	REAL	Cycle time of the controller [seconds] Minimum value = 0.1 [s]
rKp	REAL	Proportional action coefficient
rTi	REAL	Reset time [seconds]
rTd	REAL	Rate time [seconds]
rOUTPUT_MIN	REAL	Minimum value of the manipulated variable (rSETVALUE)
rOUTPUT_MAX	REAL	Maximum value of the manipulated variable (rSETVALUE)
xAUTOMATIC_MODE:	BOOL	With a "TRUE" signal the controller is switched into the automatic mode

Feedback value:	Data type:	Comment:
rSETVALUE	REAL	Manipulated variable
wERROR	WORD	Absolute value of the difference between set value and actual value
xMAX_LIMIT_REACHED:	BOOL	A "TRUE" signal indicates that the maximum output value has been reached
xMIN_LIMIT_REACHED	BOOL	A "TRUE" signal indicates that the minimum output value has been reached

Graphical display:

```
                  Control_PID
─ rACTUAL_VALUE              rSETVALUE ─
─ rREFERENCE_VALUE              wERROR ─
─ rCYCLE_TIME        xMAX_LIMIT_REACHED ─
─ rKp                xMIN_LIMIT_REACHED ─
─ rTi
─ rTd
─ rOUTPUT_MIN
─ rOUTPUT_MAX
─ xAUTOMATIC_MODE
```

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Function description

The function block "Control_PID" is a standard PID controller. The input variables actual value and set value are used to calculate the manipulated variable *"rSETVALUE"*. rTi and/or rTd can be set to zero making it a PD, PI, or P controller.

The input parameter *"rCYCLE_TIME"* predefines the cycle time of the controller. The shortest cycle time is 100 ms.

If a "TRUE" signal is at the *"xAUTOMATIC_MODE"* input, the controller calculates the output variable "rSETVALUE". If a "FALSE" signal is at the "xAUTOMATIC_MODE" input, the current output value is frozen until the controller is switched into the automatic mode.

The output variable can be limited by the input variables *"rOUTPUT_MIN"* and *"rOUTPUT_MAX"*.

In the case of a residual error variable, the limitation of the output parameter prevents further integration of the integral action coefficient.

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