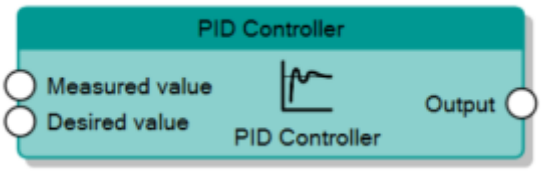
PID Controller



A **PID Controller** (Proportional-Integral-Derivative Controller) is used in control systems to maintain a desired output by adjusting inputs based on feedback.

- **Measured value**: The actual value being measured (e.g., temperature, speed, pressure).

- **Desired value**: The setpoint or target value the system aims to maintain.

- **Output**: The controlled output signal that adjusts the process to reach the desired value.

- **Sampling Time:** - The interval at which the PID controller updates its calculations in seconds

- **Threshold:** - A small tolerance value used to determine acceptable error margins.

- **Ki (Integral Costant):** – Helps eliminate steady-state error.

- **Kp (Proportional Costant):** – Determines reaction to the current error.

- **Kd (Derivative Costant):** – Predicts future errors and helps smooth the response.

- **Maximum:** – The highest value the PID controller can output.

- **Minimum:** – The lowest value the PID controller can output.

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