



PID Controller

Description

Moku:Lab's PID Controller features two fully configurable PID controllers with an output sample rate of 10 MSa/s. This enables them to be used in applications requiring both low and high feedback bandwidths such as temperature and laser frequency stabilization. The PID Controller can also be used as a lead-lag compensator by saturating the integral and differential controllers with independent gain settings.



Features

- Rapidly configure the PID controller's frequency response using an interactive Bode plot
- Observe signals at different stages in the signal processing chain using probe points
- Control up to two channels of data simultaneously with the ability to blend input signals using a control matrix
- Configure controller parameters in basic or advanced editing modes
- Implement lead-lag compensators using saturated integral and differential controllers



Specifications

Inputs

Input characteristics

Channels	2
Input control matrix coefficients (linear gain)	-20 to +20
Input impedance	50 Ω / 1 M Ω
Input coupling	AC / DC
Input attenuation	0 dB / 20 dB
Input voltage range	± 0.5 V into 50 Ω with 0 dB attenuation

Controller

General characteristics

Gain profiles	Proportional (P), integral (I), differential (D), double-integral (I+), integral saturation (IS), differential saturation (DS)
Maximum bandwidth	100 kHz with a phase delay of 30°
Input / output offset range	± 1 V
Offset precision	100 μ V

Gain characteristics

Gain profiles	Proportional (P), integral (I), differential (D), double-integral (I+), integral saturation (IS), differential saturation (DS)
Controller frequency range	100 mHz to 10 MHz
Input / output offset range	± 1 V
Offset precision	100 μ V
Proportional gain	± 60 dB
Integrator crossover frequency	1.00 Hz to 100 kHz
Double integrator crossover frequency	1.00 Hz to integrator crossover frequency
Integral saturation level	Between proportional gain and +60 dB The integrator saturation crossover frequency cannot be lower than 10 Hz
Differentiator crossover frequency	10.0 Hz to 1.00 MHz
Differentiator saturation level	Between proportional gain and +60 dB The differentiator saturation crossover frequency cannot be higher than 1 MHz