PID Controller

Description

The Moku:PIDController features two fully configurable PID controllers with an output sampling rate of 10 MHz, enabling them to be used in applications requiring both low and extremely high feedback bandwidths including temperature and laser frequency stabilization. The Moku:PIDController can 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 MΩ
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 µV

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 µV
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