Small Instrumentation Modules

SIM960 — 100 kHz analog PID controller

- Analog signal path / digital control
- 100 kHz bandwidth
- Low-noise front end
- P, I, D and Offset settable to 0.5 %
- Anti-windup (fast saturation recovery)
- Bumpless transfer, manual to PID
- Analog setpoint with smooth ramping
- Smooth upper/lower limit clamping



SIM960 Analog PID Controller

The SIM960 Analog PID Controller is a unique instrument intended for the most demanding control applications. It combines analog signal handling with digital control, giving you the best of both worlds. High bandwidth (100 kHz) control loops may be implemented without discrete time or quantization artifacts.

The low-noise front end brings better performance to noise sensitive applications including laser power and wavelength stabilization, cryogenics, scanning probe microscopy, and others. User-settable gain of up to $1000 \times$ means greater flexibility, reducing the need for input preamplification. The unit can be used together with the SIM921 AC Resistance Bridge, providing a flexible and cost-effective temperature control solution.

An internal ramp generator can control voltage slew rate between predefined start and stop setpoints. The output is clamped within upper and lower user limits to guard against system overload. The conditional integration electronics provide anti-windup on the integrating capacitors, leading to faster recovery from saturation conditions.

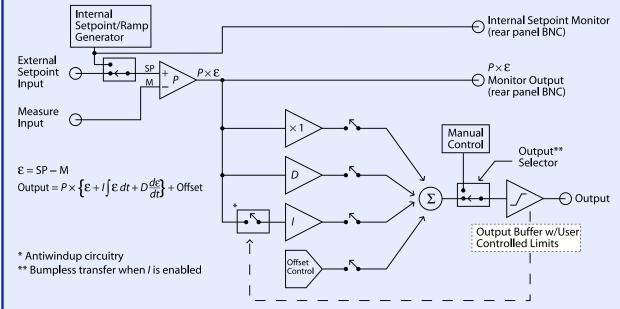
Front-panel control enables easy modification of system parameters and convenient monitoring of input and output signals. Power and serial communication are via a 15-pin D-sub connector which mates with the SIM900 mainframe. All instrument parameters can be set and queried via the serial interface.

The amplified error signal $(P \times \varepsilon)$ and the output may be monitored with an LED bar display or via the millivolt resolution numeric display. The Setpoint and Measure input signals can also be monitored on the numeric display.



SIM960 Specifications

Control type Input range Proportional gain Integral gain	Analog, PID + Offset ± 10 V Common Mode ± 1 V Differential 10^{-1} to 10^{3} 10^{-1} s ⁻¹ to 10^{5} s ⁻¹ (effective time	
Derivative gain Offset Bandwidth Propagation delay Noise (typ.) Parameter control Parameter accuracy Stability	constant 10^{-5} s to 10 s) 10^{-7} s to 1 s ± 10 V, 1 mV resolution 100 kHz 1 μ s (typ.) 8 nV/ \sqrt{Hz} above 10 Hz (ref. to input) Digital 1% 200 ppm/°C	
Setpoint External Internal Setpoint noise Ramp Amplifier output Display resolution Units	the transformation to the transformation term is the transformation to the transformation term is the transformation term in the transformation term is the transformation term in term in term in term in term is the transformation term in term in term in term is the transformation term in term	SIM960 rear panel
Operating temperature Interface Connectors	0 °C to 40 °C, non-condensing Serial via SIM interface BNC (3 front, 2 rear) DB15 (male) SIM interface	Ordering InformationSIM960Analog PID controller
Power	Powered by SIM900 Mainframe, or by user-provided DC power supply (±15 V and +5 V)	
Dimensions	3.0" × 3.6" × 7.0" (WHD) 2.1 lbs.	
Weight Warranty	2.1 los. One year parts and labor on defects	
	in materials and workmanship	SIM960 block diagram





phone: (408)744-9040 www.thinkSRS.com