# SIM960

## Технические характеристики


**По вопросам продаж и поддержки обращайтесь:**

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Россия (495)268-04-70
Киргизия (996)312-96-26-47
Казахстан (7172)727-132

rsy@nt-rt.ru || https://srs.nt-rt.ru/

# 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× 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.

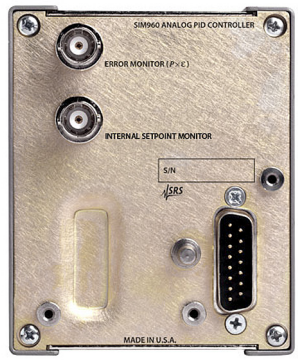
An internal ramp generator can control voltage slew rate between predefined start and stop setpoints. The output is clamped within upper and lower user limits to guard against system overload. The conditional integration electronics provide anti-windup on the integrating capacitors, leading to faster 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 | Analog, PID + Offset |
| Input range | ±10 V Common Mode<br>±1 V Differential |
| Proportional gain | $10^{-1}$ to $10^{3}$ |
| Integral gain | $10^{-1}$ $s^{-1}$ to $10^{5}$ $s^{-1}$ (effective time constant $10^{-5}$ s to 10 s) |
| Derivative gain | $10^{-7}$ s to 1 s |
| Offset | ±10 V, 1 mV resolution |
| Bandwidth | 100 kHz |
| Propagation delay | 1 µs (typ.) |
| Noise (typ.) | 8 nV/√Hz above 10 Hz (ref. to input) |
| Parameter control | Digital |
| Parameter accuracy | 1 % |
| Stability | 200 ppm/°C |
| Setpoint | |
| External | Front BNC input |
| Internal | ±10 V range with 1 mV resolution |
| Setpoint noise | 20 nV/√Hz above 100 Hz |
| Ramp | Internal setpoint linear ramping from $10^{-3}$ V/s to $10^{4}$ V/s |
| Amplifier output | ±10 V with adj. upper/lower limits |
| Display resolution | 4 digits |
| Units | $s^{-1}$, s, V, V/s |
| Operating temperature | 0 °C to 40 °C, non-condensing |
| Interface | Serial via SIM interface |
| Connectors | BNC (3 front, 2 rear)<br>DB15 (male) SIM interface |
| 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) |
| Weight | 2.1 lbs. |
| Warranty | One year parts and labor on defects in materials and workmanship |

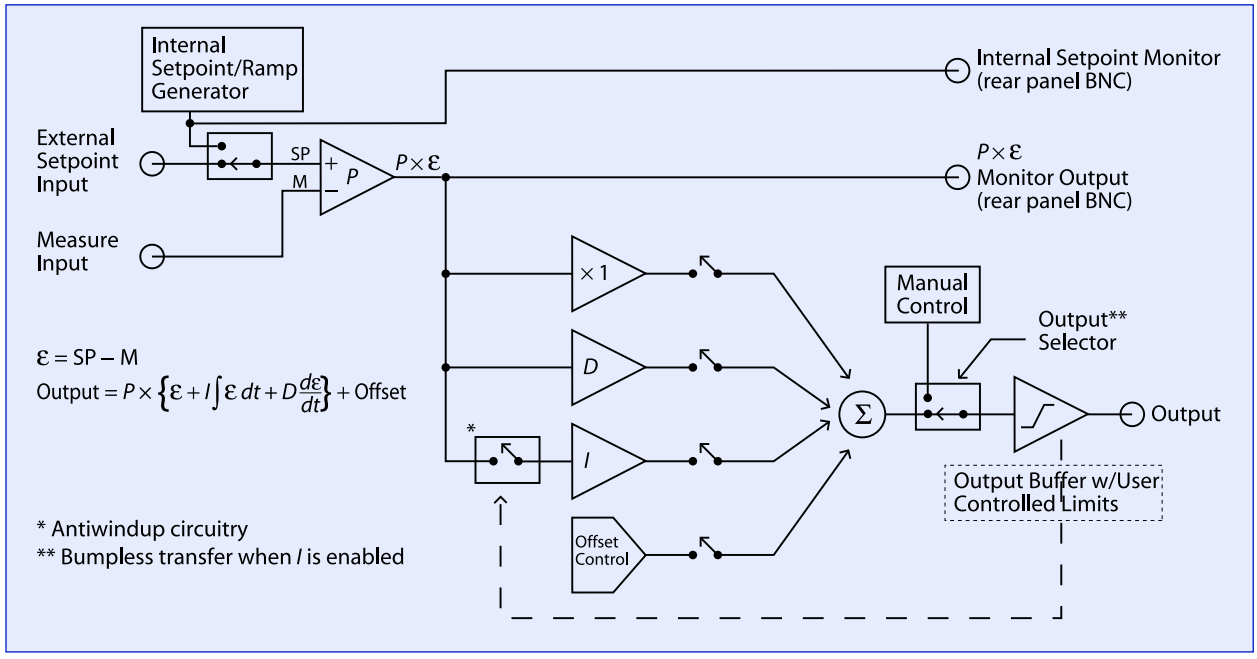



*SIM960 rear panel*

## Ordering Information

| | |
|---|---|
| SIM960 | Analog PID controller |

*SIM960 block diagram*



# Small Instrumentation Modules

*SIM900 Series — Product overview*

## SIM900 Series

- SIM mainframe
- Analog PID controller
- AC Resistance bridge
- Bessel / Butterworth filters
- Preamplifiers
- Temperature monitors
- Analog signal conditioning
- Isolated voltage source
- Octal 4-wire multiplexer
- Quad digital voltmeter
- Rubidium frequency standard

SIM — Small Instrumentation Modules — is a compact test and measurement platform for a wide range of applications. Unlike other modular systems, SIM offers complete front-panel as well as remote operation, allowing you to choose between manual and computer control. Up to eight instruments share the same mainframe which provides power, clock synchronization, communications, and module status. For additional versatility, you can cascade mainframes or other RS-232 instruments, and even operate modules outside the mainframe.

With SIM, you configure precision measurement and control systems, achieving the exact functionality you need while avoiding the cost of unnecessary features.

**По вопросам продаж и поддержки обращайтесь:**

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Россия (495)268-04-70
Киргизия (996)312-96-26-47
Казахстан (7172)727-132

rsy@nt-rt.ru || https://srs.nt-rt.ru/