SIM940

Технические характеристики

По вопросам продаж и поддержки обращайтесь:

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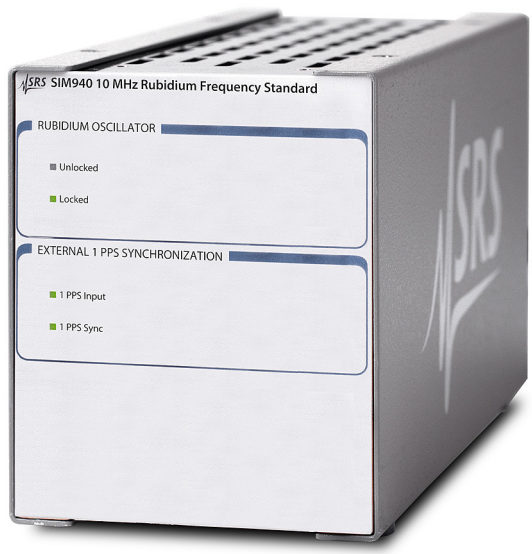
Small Instrumentation Modules

SIM940 — 10 MHz rubidium frequency standard

- Three 10 MHz outputs
- 1 pps input and output for GPS synchronization
- 20 year aging less than 0.005 ppm
- Ultra-low phase noise (<–130 dBc/Hz at 10 Hz)
- 72 hour Stratum 1 level holdover



SIM940 10 MHz Rubidium Frequency Standard

The SIM940 integrates a rubidium oscillator (SRS model PRS10) into the SIM900 platform. It provides stable and reliable performance with an estimated 20 year aging of less than 5×10^{-9} and a demonstrated rubidium oscillator MTBF of over 200,000 hours. The SIM940 is an ideal instrument for calibration and R&D laboratories or any application requiring a precision frequency standard.

There are three 10 MHz outputs with exceptionally low phase-noise and Allan variance. The SIM940 can be phase-locked to an external 1 pps reference (like GPS), providing Stratum 1 performance. A 1 pps output is also provided that has less than 1 ns of jitter and may be set with 1 ns resolution.

All functions of the SIM940 can be controlled from a computer via the SIM900 Mainframe. Both RS-232 and GPIB interfaces are supported by the mainframe.

Output

Output frequency	10 MHz sine, 10 µs wide 1 pps pulse
Amplitude (±10 %)	0.5 Vrms (+7 dBm) into 50 Ω
1 pps pulse amplitude	2.5 V into 50 Ω, 5 V into high impedance loads
Phase noise (SSB)	<–130 dBc/Hz (10 Hz) <–140 dBc/Hz (100 Hz) <–150 dBc/Hz (1 kHz) <–155 dBc/Hz (10 kHz)
Spurious	<–100 dBc (100 kHz BW)
Harmonics	<–60 dBc
Accuracy at shipment	$\pm 5 \times 10^{-11}$
Aging (after 30 days)	$<5 \times 10^{-11}$ (monthly) $<5 \times 10^{-10}$ (yearly) 5×10^{-9} (20 years, typ.)
Short-term stability (Allan variance)	$<2 \times 10^{-11}$ (1 s) $<1 \times 10^{-11}$ (10 s) $<2 \times 10^{-12}$ (100 s)
Holdover	72 hour Stratum 1 level (1×10^{-11})
Frequency retrace	$\pm 5 \times 10^{-11}$ (72 hrs. off, then 72 hrs. on)
Settability	$<5 \times 10^{-12}$
Trim range	$\pm 2 \times 10^{-9}$ (0 to 5 VDC) ±0.5 ppm (remote interface)
Warm-up time	<6 minutes (time to lock) <7 minutes (time to 1×10^{-9})

Front-Panel Indicators (LEDs)

Locked	Indicates frequency is locked to rubidium
Unlocked	Indicates frequency is unlocked
1 pps input	Blinks with each 1 pps reference input applied to rear panel
1 pps sync	"On" when 1 pps output is synchronized within ±1 µs of 1 pps input

Rear-Panel Connections

Frequency adjust	0 to 5 VDC adjusts frequency by ±0.002 ppm
1 pps input	100 kΩ input. Requires CMOS level pulses (0 to 5 VDC). If an external 1 pps input is applied, lock is maintained between the 1 pps input and 1 pps output with computer adjustable time constant from 8 minutes to 18 hours.
1 pps output	50 Ω pulse output
10 MHz outputs	Three 10 MHz sine outputs (50 Ω)
DB15/M	SIM interface (power & communication)

Environmental

Operating temperature	+10 °C to +40 °C
Temperature stability	$\Delta f/f < \pm 1 \times 10^{-10}$ (+10 °C to +40 °C)
Storage temperature	–55 °C to +85 °C
Magnetic field	$\Delta f/f < 2 \times 10^{-10}$ for 1 Gauss field reversal
Relative humidity	95 % (non-condensing)

General

Interface	Serial via SIM interface, direct to PRS10
Power	Powered by SIM900 Mainframe, or by user-provided +24 VDC power supply (2.2 A at start-up, 0.6 A after warm-up period)
Dimensions	3.0" × 3.6" × 7.0" (WHL)
Weight	5 lbs.
Warranty	One year parts and labor on defects in materials and workmanship

SIM940 rear panel

Ordering Information

SIM940	10 MHz rubidium frequency std.

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.

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