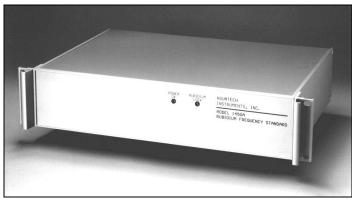


Multi-Channel Disciplined Frequency Standard

Model 1450B



The Model 1450B Rubidium Frequency Standard provides sinewave outputs of 10MHz, 5MHz, 1MHz, or 100kHz, along with up to four internal synthesizers. Containing an Atomic Resonance Rubidium Oscillator, the 1450B has stability of better than $\pm 5 \times 10^{-11}$ per month. The 1450B can be synchronized to a 1pps input to allow tracking of GPS or other primary standards. When tracking, the 1450B maintains better than $\pm 2 \times 10^{-12}$ /day with a holdover of less than $\pm 1 \times 10^{-11}$ /day. During 1pps tracking, the 1450B can be auto-calibrated. The synthesized outputs, which are locked to the Rubidium Oscillator, can be used to generate any frequency up to 50MHz with a resolution of $1 \mu Hz$.

Specifications:

FREQUENCY STABILITY

Short Term	t=1s: ±3x10 ⁻¹¹
	t=10s: ±1x10 ⁻¹¹
	t=100s: ±3x10 ⁻¹²
Aging	Monthly: ±5x10 ⁻¹¹ after 3 months
	Yearly: ±5x10 ⁻¹⁰ after 3 months
Temperature	+5 to +40°C; ±1x10 ⁻¹⁰
Line Voltage(± 10%)	±2x10 ⁻¹²
)<±1x10 ⁻¹¹
	($<\pm1\mu$ s after learning phase $>10\tau$)

FREQUENCY ACCURACY

At shipment: ±5x10⁻¹¹ at 23°C ambient temperature. Retrace: ±5x10⁻¹¹ of previous frequency (constant environment) after 72 hours ON and up to 24 hours OFF.

SINEWAVE OUTPUTS

Fixed: one @10MHz.

Up to eight auxiliary outputs can be factory set to 10MHz, 5MHz, 1MHz, or 100kHz. Optional synthesizers allow programmable values from 100Hz to 50MHz with 1 μ Hz resolution. Connectors: Rear mounted BNC Female, 50 Ω ±10%. DE9F for RS232 control of optional synthesizers.

OUTPUT AMPLITUDE

Approximately 1Vrms into 50Ω all outputs. (TTL levels optional on auxiliary outputs).

SPECTRAL PURITY (Sine only, Typical)

10MHz, 5MHz, 1MHz, or 100kHz: Harmonic: <-25dBc, Non-Harmonic: <-70dBc. **Synthesized:** Harmonic <-35dBc, Non-Harmonic <-60dBc; Phase Noise (typ.) -120dBc, 10kHz off-set, 5MHz. Spurious (all outputs): <-35dBc.

PHASE NOISE (10MHz output, typical dBc/Hz)

Freq. Offset	dBc/H
10Hz	-92
100Hz	-125
1kHz	-140
10kHz	-142

1pps IN and OUT

Rear Panel BNCs for 1pps IN and 1pps OUT. 1pps in accepts TTL level 1pps signals. 1pps OUT is TTL level when series terminated (derived from internal rubidium).

ENVIRONMENTAL

Temperature: 5°C to 40°C operating

Humidity: 80% to 31°C, decreasing linearly to 50% at 40°C

SIZE

8.8cm H, 42.5cm W, 30.5cm D excluding rack handles and connectors. (Standard 2U, 19-inch rack)

LINE POWER

120/240 VAC ±10%, 50/60Hz. 50 VA (70 VA during warm-up, <30 minutes).

FRONT PANEL STATUS INDICATORS

POWER OK: LED indicates power status.

RUBIDIUM LOCK: LED (and rear panel TTL) indicates

Rubidium Oscillator lock status.

PPS LOCK: LED indicates when the 1450B is locked to and tracking a stable 1pps input.

OPTIONS

Outputs can be configured to have up to four different synthesized frequencies, either at TTL levels or 1Vrms sine waves. Custom versions are available. A matching GPS smart antenna system is available.

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